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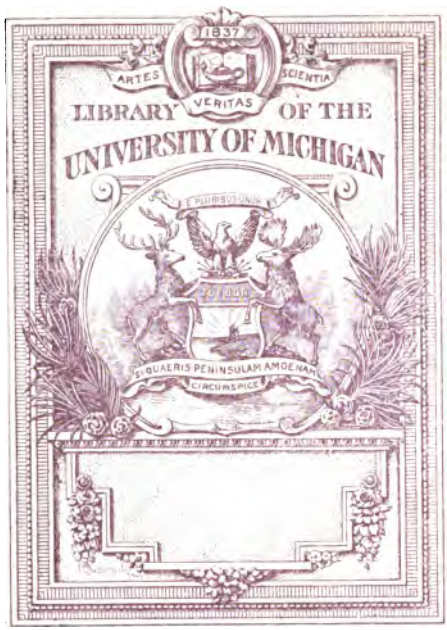

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Sincerely Yours.
E. C. Brush.

THE OHIO STATE MEDICAL SOCIETY

TRANSACTIONS

OF THE

Fifty-Seventh Annual Meeting

HELD AT

TOLEDO, OHIO

MAY 28, 29, 30, 1902

CLEVELAND
PRESS OF J. B. SAVAGE
1902

THE

FIFTY-EIGHTH ANNUAL MEETING

OF THE

OHIO STATE MEDICAL SOCIETY

WILL BE HELD AT

DAYTON, JUNE 3, 4, 5, 1903

OFFICERS

OHIO STATE MEDICAL SOCIETY

President . . . . . W. C. CHAPMAN, M. D., Toledo
First Vicepresident . . GEORGE W. CRILE, M D., Cleveland
Second " . . CLOVIS M. TAYLOR, M. D., Columbus
Third " . . . . . MARTIN STAMM, M. D., Fremont
Fourth " . . P. D. COVINGTON, M. D., Bellefontaine
Secretary . . . . . P. MAXWELL FOSHAY, M. D., Cleveland
Treasurer . . . . . JAMES A. DUNCAN, M. D., Toledo

COMMITTEES

Finance

H. A. ZIMMERMAN, M. D. (98)
W. J. CONKLIN, M. D. (99)
E. C. BRUSH, M. D. (1900)
J. C. OLIVER, M. D. (1901)
A. F. HOUSE, M. D. (1902)

Ethics

R. B. HART, JR., M. D. (98)
D. R. SILVER, M. D. (99)
J. H. RODGERS, M. D. (1900)
F. W. BLAKE, M. D. (1901)
M. L. HEIDINGSFELD, M. D. (1902)

Publication

J. M. FRENCH, M. D. (98)
J. P. SAWYER, M D. (99)
DAN MILLIKIN, M. D. (1900)
JESSE SNODGRASS, M. D. (1901)
E. J. WILSON, M. D. (1902)
W. C. CHAPMAN, M. D., AND P. MAXWELL FOSHAY, M. D. (ex-officio)

Legislation

D. N. KINSMAN, M. D. (98)
N. P. DANDRIDGE, M. D. (99)
T. M. GEHRETT, M. D. (1900)
T. C. MARTIN, M. D. (1901)
S. B. HINER, M. D. (1902)

National Medical Legislation

N. R. COLEMAN, M. D.

Admission and Medical Societies

THOMAS HUBBARD, M. D. (98)
FRANK WINDERS, M. D. (99)
N. S. SCOTT, M. D. (1900)
T. M. WRIGHT, M. D. (1901)
W. E. LOUGHRIDGE, M. D. (1902)

Growth and Prosperity

WM. H. HUMISTON, M. D. (term expires 1903)
C. S. JUDY, M. D. (term expires 1904)
C. F. CLARKE, M. D. (1900)
P. J. KLINE, M. D. (1901)
C. L. BONIFIELD, M. D. (1902)

Chairman of Committee of Arrangements for Dayton Meeting June 3, 4 and 5, 1903

JOHN S. BECK, M. D.

166589

Ohio State Medical Society

At the Seventeenth Annual Meeting of the Ohio State Medical Society, the following resolution was adopted:

Resolved, That the publication of any address, prize essay, or other paper, by this Society, is no evidence of its endorsement of the sentiments therein contained.

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CHAPTER I—THE MINUTES

INCLUDING

REPORTS OF OFFICERS AND COMMITTEES

The Minutes of the Fifty-Seventh Annual Session of the Ohio State Medical Society

The fifty-seventh annual session of the Ohio State Medical Society was called to order in Zenobia Hall, Toledo, by President Brush, a 2 p. m., May 28, 1902. The invocation was delivered by Rev R. S. Young.

Hon Samuel M. Jones, Mayor of Toledo, made the address of welcome, and a short response was made by the President.

On motion of John S. Beck, M. D., of Dayton, the Secretary was authorized to employ a stenographer for the session.

The report of the Committee of Arrangements was made by the chairman, W. C. Chapman, M. D., of Toledo.

The President appointed as the Committee on Nominations, Park L. Myers, M. D., of Toledo; B. Merrill Ricketts, M. D., of Cincinnati; Frank Warner, M. D., of Columbus; John S. Beck, M. D., of Dayton, and Frank D. Bain, of Kenton.

A paper, "Management of Pregnacy," was read by W. S. Phillips, M. D., of Belle Center.

A paper, "Management and Preparation for the First Stage of Labor," was read by William W. Pennell, M. D., of Fredericktown.

A paper, "Anesthetics," (in obstetrics) was read by Frank D. Bain, M. D., of Kenton.

A paper, "When to Use the Forceps," was read by Frank S. Clark, M. D., of Cleveland.

The foregoing papers upon obstetrics were then discussed by John A. Wright, M. D., of Toledo.

A paper, "A Case of Acute Tuberculosis of the Peritoneum," was read by Dudley P. Allen, M. D., of Cleveland.

A paper, "Report of Some Cases of Thyroid Surgery," was read by J. C. Oliver, M. D., of Cincinnati. It was discussed by John B. Alcorn, M. D., of Gallipolis; Dudley P. Allen, M. D., of Cleveland; W. J. Means, M. D., of Columbus; Martin Stamm, M. D., of Fremont; John North, M. D., of Toledo; James F. Baldwin, M. D., of Columbus, and the discussion was closed by Dr Oliver.

A paper, "An Analysis of 350 Operations for Appendicitis," was read by George W. Crile, M. D., of Cleveland. It was discussed by James F. Baldwin, M. D., of Columbus; Thad. A. Reamy, M. D., of Cincinnati; F. F. Lawrence, M. D., of Columbus; Dudley P. Allen, M. D., of Cleveland; W. J. Means, M. D., of Columbus; Rufus B. Hall, M. D., of Cincinnati; O. T. Maynard, M. D., of Elyria; B. E. Sager, M. D., of Cleveland; Charles L. Bonifield, M. D., of Cincinnati; F. D. Case, M. D., of Ashtabula, and the discussion was closed by Dr Crile.

The Society then adjourned to meet at 8 p. m.

Evening Meeting, Wednesday, May 28

An announcement by the Committee of Arrangements was made by W. C. Chapman, M. D., of Toledo.

A paper, "The Treatment of Suppurative Inflammation of the Kidneys," was read by Frank Warner, M. D., of Columbus.

A paper, "The Surgery of the Thyroid Gland," was read by B. Merrill Ricketts, M. D., of Cincinnati, and was illustrated by lantern-slide views.

A paper, "Neuroparalytic Keratitis," was read by Thomas F. Kellar, M. D., of Toledo. It was discussed by J. H. McCassy, M. D., of Dayton.

The report of the Committee on Organization was presented by P. Maxwell Foshay, M. D., of Cleveland. With the exception of a few introductory remarks the report consisted of a new Constitution and By-Laws. [As the draft of the new Constitution and By-Laws was subsequently adopted with only a few minor changes that will be noted, and as the complete instrument as finally adopted is published in full at the end of this volume, it is omitted from the published minutes.] Charles L. Bonifield, M. D., of Cincinnati, moved that the report be received. Charles A. L. Reed, M. D., of Cincinnati, moved that the report be adopted, and this motion was seconded by F. F. Lawrence, M. D., of Columbus. After some scattering remarks and proffered amendments, Dr Reed's motion was amended to mean that the report should be received and referred to the Committee again with instructions to give an immediate hearing to all who wished to discuss the report or to propose amendments to the same. Dudley P. Allen, M. D., of Cleveland, said that the amendments were so involved as to obscure the intent of the motion, and he moved that the original motion with all amendments be laid on the table. This motion was lost. The motion to refer to the Committee was then put and carried, after some discussion by E. J. Wilson, M. D., of Columbus, and Thad. A. Reamy, M. D., of Cincinnati. It was also agreed that the report of the Committee should be made the special order of business for 10 o'clock the next morning.

The meeting then adjourned.

A large number of the members remained in the hall and the proposed Constitution and By-Laws was then read section by section and freely discussed. The following amendments were agreed to:

Section 1, of Article VIII of the Constitution, was amended so that theVicepresidents should be arranged in order as first, second, third or fourth.

Section 2, of Chapter IV of the By-Laws, was amended so that any fraction of members of a county society above

100 should entitle that society to an additional delegate, instead of a "major fraction."

Section 11 of the same chapter was amended so as to make it obligatory for the new House of Delegates to divide the State into 10 Councilor Districts, instead of permissive.

Section 13 of the same chapter had the following proviso appended: "providing it shall not render void the verdict of a referendum."

Section 2 of Chapter VI was amended by striking out the words "the Council shall elect one of the Vicepresidents to succeed him" and inserting in their stead "the Vicepresidents shall succeed him in the order of their election."

Section 1 of Chapter IX was so amended as to make the annual dues one dollar ($1.00), instead of two ($2.00), as proposed.

Chapter X, which in the draft read: "The principles set forth in the Code of Ethics of the American Medical Association shall govern the conduct of members in their relation to each other and the public," was, on motion of John S. Beck, M. D., of Dayton, amended to read as follows: "The ethical principles governing the members of the American Medical Association shall govern the conduct of the members of this Association in their relation to each other and to the public." The conference then voted unanimously to recommend that the Society on the following morning adopt the amended report.

Thursday, May 29, Morning Session

The Society was called to order by the President at 9:15 a. m. The minutes of the previous meeting were read and approved.

The President announced that only members in good standing were entitled to the privileges of the floor.

A paper, "Puerperal Neuritis," was read by Charles J. Aldrich, M. D., of Cleveland.

A paper, "Acute Suppurative Ethmoïditis," was read by John A. Thompson, M. D., of Cincinnati. It was discussed by J. H. McCassy, M. D., of Dayton.

It then being 10 o'clock, the report of the Committee on Organization by the agreement made at the previous meeting, became the special order of business. The report, as amended at the conference on the previous evening, was then presented by P. Maxwell Foshay, M. D., of Cleveland, Chairman of the Committee on Organization. On motion of Frank D. Bain, M. D., of Kenton, the report of the Committee, consisting of the new Constitution and By-Laws, was unanimously adopted along with the following provisos:

"Because it is the earnest desire of this Society to retain within its membership every present permanent member, as well as to bring within its fold every physician who is in good professional standing, it is hereby agreed and ordered that the House of Delegates of the reorganized Ohio State Medical Association shall at its first meeting carefully consider the situation of those present permanent members who happen to live in an unorganized county, or who are not at present members of their county society. Every effort shall be made to care for the rights of these members in the reorganized Association by assisting them in the organization of county societies in the unorganized counties and in case a county society already exists in affiliation with this body, by insisting that such society shall receive into membership every such permanent member, unless there exist the most cogent reasons to the contrary, and unless the appeal of such member has been rejected by the Council of the Association."

"It is further ordered and agreed that the new Constitution and By-Laws shall go into force and become effective immediately upon adjournment of this annual session of 1902, provided that the collection of annual dues from the present permanent members, and other routine business not otherwise provided for, shall proceed as heretofore until the annual session of 1903, when the assembling of delegates

from the component societies will furnish opportunity for the full consideration and determination of such matters."

"All present life-members shall be continued as such, and hereafter all members who have paid dues regularly for 25 consecutive years shall become life-members without further payment of dues."

The Committee on Admission made a partial report, and on motion the 35 applicants for membership whose names were reported favorably by the Committee were elected members.

A paper, "The Diagnosis and Treatment of Injuries of the Spine," was read by W. J. Means, M. D., of Columbus. It was discussed by Eugene G. Carpenter, M. D., of Columbus; C. E. Beardsley, M. D., of Ottawa; Wm. E. Wirt, M. D., of Cleveland; Martin Stamm, M. D., of Fremont; Chas. J. Aldrich, M. D., of Cleveland; Brooks F. Beebe, M. D., of Cincinnati, and the discussion was closed by Dr Means.

The Committee on Admission made a partial report, and on motion 24 applicants for membership whose names were reported favorably by the Committee were elected members.

A paper, "Six Cases of Right Hemiplegia with Aphasia," was read by George A. Collamore, M. D., of Toledo.

The Society then adjourned to meet at 1:30 p. m.

Thursday, May 29, Afternoon Meeting

The Society was called to order at 1:50 p. m. The minutes of the previous meeting were read and approved.

The Treasurer, James A. Duncan, M. D., of Toledo, read his annual report.

Treasurer's Report

RECEIPTS.

Balance	$ 102 75
Initiation and Dues	1,696 00
Total	$1,798 75

DISBURSEMENTS.

Dr J. A. Thompson, Secretary, 1900		$ 125 00
Dr P. Maxwell, Foshay, Editor, 1900		302 54
Salary	$ 100 00	
Printing, Postage and Exp	202 54	
D. L. McAuliff, Asst. Sec'y		$ 10 00
Dr J. A. Duncan, Treasurer		209 10
Salary	$ 125 00	
Postage	36 00	
Printing and Stationary	40 60	
Surety Bond	7 50	
E. E. Akers, Asst. Treasurer		$ 25 00
Dr F. D. Bain, Expenses		3 50
American Express Co		105 64
L. B. Tuckerman, Leg. Com		63 33
Steven E. Cone, Stenographer		50 00
L. S. & M. S. R. R. Co.—Freight		5 83
J. B. Savage, Printing		50 90
J. B. Savage, Printing 1901 Trans		588 50
Central Traffic Assn		11 00
Dues Returned		11 00
Balance		237 41
Total		$1,798 75

On motion the Treasurer's report was referred to the Finance Committee. The report of the Secretary was read and ordered filed.

Secretary's Report

At the fifty-sixth annual meeting of the Ohio State Medical Society at Cincinnati in 1901, 109 permanent members were elected. Notices have been received of the deaths since the last meeting of Columbus P. Brent, of Cincinnati; William H. H. Nash, of Columbus; David S. Perkins, of Cleveland; L. B. Tuckerman, of Cleveland; William H. Zopfi, of Findlay; J. S. Combes, of Owensville; H. J. Herrick, of Cleveland, and Alexander Neil, of Columbus.

Our total list of members corrected up to this meeting aggregates 989 names. It is a pleasure to report renewed

activity on the part of all the affiliated societies and to note the fact that four new county societies have applied for affiliation during the last few months—these are Mahoning, Seneca, Summit and Union. In addition, new societies have been organized in Lake and Wood counties.

Of still greater significance in reference to the revival of interest in medical organization is the consolidation of societies in Clarke and Cuyahoga counties, and the determined effort to bring about a union of interests in Lucas and Stark counties.

During the past winter considerable work was necessary to prevent the Legislature from so amending our medical law as to materially injure its utility. Numerous conferences between the members of the Committee on Legislation and physicians from various counties of the State were held at Columbus. It required repeated and most determined efforts to prevent the passage of the medical student's bill and of the bill legalizing osteopathy. The first was entirely defeated, but the last could only be met by a compromise, as the Legislature had predetermined to give aid to the osteopaths. The compromise puts into the hands of our present medical board the regulation of osteopathy, and compels the followers of that cult to be pretty well educated before they can practice in Ohio.

The Committee on Admissions reported favorably upon a number of applicants for membership, and on motion they were elected members.

The Committee on Admissions and Medical Societies made the following additional reports:

Your Committee on Admissions and Societies recommends that the Summit County Medical Society, Mahoning County Medical Society, and Seneca County Medical Society be admitted to affiliation with the State Association.

That the Union County Medical Society be admitted to affiliation with the State Association when its Constitution and By-Laws are revised to conform to the requirements of

the new organization (see Article II), and it has officially notified the Secretary of the State Medical Association.

The withdrawal of the junior society at Dayton, known as the Dayton Academy of Medicine, in favor of the Montgomery County Medical Society is hereby accepted and its action is approved.

The communication from physicians of Stark County concerning the Stark County Acadamy of Medicine is referred to the Council acting under and created by the new Constitution and By-Laws.

In the matter of the application of the Franklin County Medical Society for affiliation with your society, your Committee on Admissions and Medical Societies beg leave to report that in view of the fact that a reorganization of the State Society has just taken place, we would recommend that this matter be referred to the Council to be elected under the reorganization.

That the communication of R. C. M. Lewis, M. D., of Marion, be referred to the Council.

On motion these reports were adopted.

The Committee on Publication reported that, through the neglect of the Secretary, no bids for the publication of the transactions of the meeting had been secured, and that P. M. Foshay, M. D., of Cleveland, had been reappointed editor.

On motion the committee was authorized to secure bids and to enter into a satisfactory contract for the publication of the transactions.

The Finance Committee reported that the Treasurer's books had been found to be correct.

The President announced that the election of officers was the next order of business, and called for the nominations for President.

W. A. Dickey, M. D., of Toledo, nominated S. S. Thorn, M. D., of Toledo. The nomination was seconded by W. H. Harper, M. D., of Lima. Thad. A. Reamy, M. D., of Cincinnati, nominated W. C. Chapman, M. D., of Toledo. The nomination of Dr Chapman was seconded by Chas. A. L.

Reed, M. D., of Cincinnati, and John A. Thompson, M. D., of Cincinnati. The nomination of Dr Thorn was seconded by John A. Wright, M. D., of Toledo. The President appointed as tellers Charles C. Chamberlin, M. D., of Cincinnati, and Nelson Young, M. D., of Toledo. Dr Chapman having received a majority of the votes cast was declared elected President for the ensuing year. Dr Dickey and Dr Thorn moved to make the election unanimous, and the motion was carried.

The report of the Committee on Nominations was read by the chairman, Park L. Myers, M. D., of Toledo. On motion the report was adopted and the men named declared elected to the respective offices for the ensuing year.

Report of the Committee on Nominations

For First Vicepresident, George W. Crile, M. D., Cleveland.

For Second Vicepresident, Clovis M. Taylor, M. D., Columbus.

For Third Vicepresident, Martin Stamm, M. D., Fremont.

For Fourth Vicepresident, P. D. Covington, M. D., Bellefontaine.

For Secretary, P. Maxwell Foshay, M. D., Cleveland.

For Treasurer, James A. Duncan, M. D., Toledo.

For member of Finance Committee, A. F. House M. D., Cleveland.

For member of Ethics Committee, M. L. Heidingsfeld, M. D., Cincinnati.

For member of Publication Committee, E. J. Wilson, M. D., Columbus.

For member of Legislation Committee, S. B. Hiner, M. D., Lima.

For member of National Medical Legislation Committee, N. R. Coleman, M. D., Columbus.

For member of Admissions Committee, W. E. Loughridge, M. D., Mansfield.

For member of Growth and Prosperity Committee, C. S. Judy, M. D., Miamisburg.

For Members of Council:

Horace Bonner, M. D., Dayton.
J. E. Cook, M. D., Cleveland.
E. C. Brush, M. D., Zanesville.
Frank D. Bain, M. D., Kenton.
Brooks F. Beebe, M. D., Cincinnati.
T. W. Rankin, M. D., Columbus.
H. H. Jacobs, M. D., Akron.
J. H. Jacobson, M. D., Toledo.
John E. Sylvester, M. D., Wellston.

For Delegates to the American Medical Association at Saratoga:

C. A. L. Reed, M. D., Cincinnati.
P. Maxwell Foshay, M. D., Cleveland.
Frank Warner, M. D., Columbus.

For Alternate Delegates:

Edwin Ricketts, M. D., Cincinnati.
T. Clarke Miller, M. D., Massillon.
George Goodhue, M. D., Dayton.

For location of next meeting of the Ohio State Medical Society, the committee recommend Dayton.

Respectfully,

PARK L. MYERS,
B. M. RICKETTS,
FRANK WARNER,
J. S. BECK,
F. D. BAIN.

Charles A. L. Reed, M. D., of Cincinnati, introduced the following resolution, which after some remarks by S. S. Thorn, M. D., of Toledo, was adopted:

"Resolved, That the Ohio State Medical Association, as a constituent organization of the American Medical Association, views with extreme satisfaction the negotiations now in progress to consolidate the New York State Medical Association and the Medical Society of the State of New York into one organization under the auspices of and in affiliation with the American Medical Association; and the representatives from the Association to the National House of Delegates are hereby instructed to use every possible means to secure a final consummation of such consolidation at the

meeting of the American Medical Association to be held at Saratoga in June prox."

The annual presidential address was then delivered by the President, Edmund C. Brush, M. D., of Zanesville.

The President-elect, W. C. Chapman, M. D., of Toledo, was then introduced by S. S. Thorn, M. D., of Toledo, and made a few appropriate remarks.

The Committee on Admissions made a further report, and on motion the names of applicants for membership that were favorably acted upon were elected members.

A paper, "Practive *vs.* Malpractice," was read by Mr Smith W. Bennett, Special Counsel in the office of the Attorney-General of Ohio.

A paper, "Emphysematous Gangrene," was read by Martin Stamm, M. D., of Fremont. It was discussed by S. S. Thorn, M. D., of Toledo; Julius H. Jacobson, M. D., of Toledo, and the discussion was closed by Dr Stamm.

A paper, "A Simple Technic for the Removal of Hemorrhoids Under Local Anesthesia," was read by Thomas Charles Martin, M. D., of Cleveland. It was discussed by E. W. Mitchell, M. D., of Cincinnati; W. G. Dice, M. D., of Montpelier, and the discussion was closed by Dr Martin.

A paper, "A New Formula for Injections in the Constitutional Treatment of Syphilis," was read by M. L. Heidingsfeld, M. D., of Cincinnati. It was discussed by J. H. McCassy, M. D., of Dayton, and the discussion was closed by Dr Dr Heidingsfeld.

On motion of A. F. House, M. D., of Cleveland, privileges of the floor were conferred upon the guests of the Society, James Tyson, M. D., of Philadelphia; A. J. Ochsner, M. D., of Chicago, and W. J. Mayo, M. D., of Rochester, Minn.

The annual address in Surgery, "The Effect of Rest Upon the Progress of Septic Infection," was delivered by A. J. Ochsner, M. D., of Chicago. The address was discussed by D. N. Kinsman, M. D., of Columbus. Frank Warner, M. D., of Columbus, moved that a vote of thanks be extended to Dr Ochsner by the Society. The motion was abundantly

seconded. S. S. Thorn, M. D., of Toledo, moved to amend the motion so that Dr Ochsner should by the same vote be elected an honorary member of the Society. The motion as amended was unanimously adopted. S. S. Thorn, M. D., then discussed the subject of the address.

The Society adjourned to meet at 8 p. m. at "The Farm."

Thursday, May 29, Evening Session

The Society was called to order by the President at 8 p. m.

The Address in Medicine, "The Present State of Our Knowledge of Diabetes Mellitus," was delivered by James Tyson, M. D., of Philadelphia, Professor of Medicine in the Medical Department of the University of Pennsylvania. On motion, a vote of thanks was unanimously extended to Dr Tyson, and he was duly elected an honorary member of the Society.

The Society then adjourned, the members repairing to the adjoining hall, where the annual banquet was served.

Friday, May 30, Morning Session

The meeting was called to order by the President at 9:30 a. m.

A paper, "Symptomatology and Clinical Diagnosis of Diphtheria," was read by F. D. Case, M. D., of Ashtabula.

On motion the order of the program was changed, and the following paper was taken up out of its regular order:

A paper, "Natural Selection as Applied to Specialism in Medicine," was read by Charles H. Higgins, M. D., of Sonora.

The Committee on Admissions made a supplementary report and the candidates whose names were favorably reported were elected members.

A paper, "The Medical Treatment of Diphtheria," was read by J. C. Crossland, M. D., of Zanesville,

A paper, "The Surgical Treatment of Laryngeal Diphtheria," was read by C. L. Patterson, M. D., of Dayton.

A paper, "Diphtheriana—A Survey," was read by Park L. Myers, M. D., of Toledo.

The papers upon diphtheria were jointly discussed by W. J. Mayo, M. D., of Rochester, Minn.; A. J. Ochsner, M. D., of Chicago; James Tyson, M. D., of Philadelphia; Thomas Hubbard, M. D., of Toledo; John P. Sawyer, M. D., of Cleveland; C. S. Judy, M. D., of Miamisburg, and the discussion was closed by Drs Case, Crossland, Patterson and Myers.

A paper, "Deductions from Personal Experiences in a Hospital for Tuberculosis," was read by B. F. Lyle, M. D., of Cincinnati.

The President announced the death of E. J. Sinnet, M. D., of Granville, one of the oldest members of the Society.

The President introduced the President-elect, W. C. Chapman, M. D., of Toledo, who, after a few remarks and in response to a motion, declared the session adjourned *sine die*.

CHAPTER II—ADDRESSES

Address of the President

EDMUND C. BRUSH, A. M., M. D., Zanesville

Several matters in connection with the present reorganization have come to my mind. I will take the opportunity afforded me by our Constitution to present them to you.

The American Medical Association is undergoing a process of reorganization that will, it is believed, be of advantage to that body and to the profession in general. The idea is to increase its membership so as to have the profession of the United States consolidated into one great Medical Union. The various State medical societies were organized at different periods, largely governed by the age and population of the different States. The constitutions under which these many State societies exist are as varied as is their number. The present scheme of reorganization contemplates an uniformity in the constitution of State societies. There is a general feeling that this is in the line of advancement and cohesion. Unless something unforeseen happens to prevent, this uniformity of organization will be accomplished in a very few years.

In line with that idea this society appointed a committee in 1901 to formulate a plan of reorganization and of widening its scope of usefulness in a professional and in a business way.

It is conceded that this society has not the numerical strength it should have. Instead of 1,000 members there should be five times that number. In 56 years this Society has grown from an original membership of 25 to a present membership of 1,000. That increase is not in ratio with

the times, the facilities of travel and the increase of population centers. The foundation of the whole medical society world is the local society. Local societies that have good meetings, and interesting matters for consideration, have a large attendance. This stimulates a desire for a wider field, and we find that energetic societies send the larger delegations to the State and National meetings.

Men form the medical society habit, and the men who have this habit are the leaders in their respective sphere. Those who have attended even a few meetings of this society have observed this. The attendance at any medical society is largely made up of the busy men. The drones stay away. We hear some men say that they are too busy to attend medical societies, but in looking over these societies we find that men who have a patronage not confined by local or State lines are there, and not too busy to be there either.

The medical society habit is formed in the home organization, and I wish to say some things in regard to local medical societies. The tendency, in the larger cities, is to have too many organizations. College cliques, hospital cliques, and those who are in no clique get together and form a society and the result is too many different societies. There is no one locality in this State where there are too many medical men for one society, if they could be made to think so.

In direct contrast with the foregoing is the smaller place where the material is not abundant for even one organization. Then, too, the smaller ones have a laudable desire to hold monthly meetings. The result is that in a short time the interest flags and so does the society. It would be better to have quarterly meetings or to join forces with the most accessible neighbor.

The multiplicity of medical journals, and the quick mail facilities of today, make these journals competitors of the local society. Through these journals even the isolated physician is kept in weekly contact with the medical

world. At his leisure he may read the papers and the discussions held in his own and many other medical societies. That fact is a serious obstacle to the welfare and growth of the smaller organization. There is needed something more than the purely professional work at society meetings to draw men to them with regularity. True it is that a few are always on hand and ready to work, but a great many require outside attractions, and we must face the conditions as they exist. The few who prepare papers do not want to read them to empty seats. The great incentive to paper writing is a good audience.

Someone has estimated that one physician in every four belongs to a medical society. In our efforts to polish off the superstructure and to establish a great national organization, it might be well to begin with some home missionary work on the foundation. If some man, or body of men, would devise ways and means by which every county could have a county society with all of the physicians in the county as members, there would be a crown of glory in waiting for him, or them.

Of recent years it has become quite the thing for local societies to have an occasional lunch, inviting some physician from another locality to deliver an address. That sort of thing often insures a good meeting, but the next announcement is simply for a meeting without any extras, and the result is a poor meeting, if any. A good supper draws better than a good paper. The next best thing then is to combine them.

The effort to make the local society a part of the State organization is not practicable. Many of the practicians in the smaller towns have little interest in any outside society. This is largely because they do not branch out and get acquainted. They go to their home society and meet friends and acquaintances. If they go to the State society the only friends they meet are the home friends who go with them. There is more or less intercourse among the profession in the larger places and acquaintances are plentiful. If some-

thing could be done to get the men from the smaller places in the habit of going to our State meetings, they would soon have as many friends and acquaintances as any, and derive much pleasure in the annual hand-shake and talk. There should be an effort made to make every practician consider the State society his society, and that his presence at the annual meeting contributed toward its success.

Some of these same men, when asked to have a paper for a State meeting, decline because they are diffident about reading articles before men who are, perhaps, teachers of the subject upon which they could write. The chances are that the paper would teach the teacher a great many practical ideas that would be of merit. When a man gets up in this society and reads a practical paper of interest to the busy doctor, he is accorded close attention, and no one cares whether the author practices alongside of a college or a blacksmith-shop. Not, "Where did you come from" but, "Have you something that will be useful to your fellow-man," is the question. When a man appears before this society and gives a dissertation on some theory, the members go out and get samples of medicine and look at the X-ray machine. This society wants and needs all the every-day and all-kinds-of-a-day practicians with their practical knowledge. We want every reputable physician in this State to feel that this is his State Medical Society. In order to do this we must begin the work in the local organization.

The connection between the local and State gatherings must be more intimate. There must be a closer common union. The ultimate result of the complete national and State organization is to recognize but one local society. Under such conditions, men must belong to the local recognized society before they may join the State society and then find admission into the American Medical Association.

In the large centers specialists do and will have their own societies. There can be no possible objection to this, but these same men should belong to the recognized society and thus help to support it. There should be no State socie-

ties of specialists. Where their number justifies it, they should form sections of the State organization. There are in this State, and in others, what are called district societies. These are formed by men in localities when available meeting points are accessible. They bring together neighbors and friends and in many ways are profitable and enjoyable, Yet these same district societies detract from the work of the local and State meetings.

Medical men can find plenty of vent for their professional knowledge and good fellowship in local and State meetings. Important as the State and national associations may be, the local association is of prime importance. In this fever of reorganization, we must not forget the underpinning to the whole fabric.

The constitution of every State society should be in conformity to that of the American Medical Association. The constitution of every local society should be in conformity to its State society. Then the medical fraternity of this country could be likened to a wheel. The local societies would represent the hub. The various State societies would represent the spokes radiating from the hub. The American Medical Association would represent the felly, binding the whole into a strong and useful object. The membership of this society must come from the local organization, and if we could become imbued with the idea of unity, conformity and efficiency, we could go home and, by putting aside personal antagonisms, get together in one society in every county.

There is another view of this whole matter that is worthy of thought. That is the financial outlay. With so many societies and a desire to be in them, the dues become burdensome to many. Were society dues the only outlay it would be different, but the up-to-date physician has many expenses besides. New books, new appliances, medical journals and many other things make a physician's working-expenses very heavy. The younger men, no matter how enthusiastic they may be, must consider these things. Yet

the younger men should, for their own good and the good of the older ones, be at medical meetings. The older men temper the zeal and enthusiasm of the younger ones—the younger ones make the older ones shake off the dust of time and keep in the race. The spur of youth guided by the wisdom of age brings good results.

Let me call your attention to another matter; then I am through. During the past 10 years it has cost this society $8,218.01 for publishing, distributing, editing, and the employment of stenographers in connection with our annual volume of transactions. As the society grows this expense must increase because more volumes will be needed. It is safe to say that the publication of our transactions for the next 10 years will average $1,000 a year. In the early history of this society these volumes carried to the absent members an account of the proceedings. Today those who do not attend the meetings get the papers read here in their medical journals, and in complimentary reprints, months before the volume of transactions appear.

In the 10 years to come can $10,000 be spent to a better advantage? Why not use $1,000 per year for 10 years in bringing the State and local societies together and in establishing a closer relationship? Use it on the less fortunate localities in numbers and local attractions and thus do missionary work. That $10,000 to be spent in 10 years should be spent for the good of the many not the few.

Think over this. Are your transactions of any real value to you? Have one out of 20 of you opened your volumes of transactions of last year? Those who have, probably, wanted to see if their papers were published. In order that no historic matter should be lost, if the publication of the transactions is abandoned, we could have an historic paper prepared at the end of every decade. Gentlemen, the great thing, the important thing to consider in this whole reorganization epidemic, is the local society. The general practician and, that noblest Roman of them all, the country doctor, make up the substantial mass of the medical profession. Let us reach out hands to all, and when we join hands, we will have a complete circle.

Malpractice

By SMITH W. BENNETT, ESQ., Columbus
Special Counsel in the Office of the Attorney-General

Before proceeding with the subject assigned me, I wish to acknowledge that I deem it cause for self-gratification to be invited to appear before the members of a great profession, which has in all ages contributed so many noble self-sacrificing men to the needs of humanity; a profession which is not alone content to assuage pain and alleviate human ills, but which stands in the forefront of civilization's advance, with a genius for investigation and research, sounding back along the advancing columns the results of its efforts in words, possibly of admonition and alarm, but always of wisdom.

I should also felicitate you, that in Ohio your Society with its excellent corps of officers has in such a marked degree contributed to the enactment of laws governing the entrance to your profession, that in point of comparison with other States places them among the wisest and best of medical legislation.

Malpractice is one of the few "golden" cords that binds your profession to mine; the subject can have no attractions to as eminent a body as this, for I find by examination of the proceedings of the Medico-Legal Society that there has been but one paper read upon the topic in a period of eighteen years. I can deduce but one of two conclusions from this fact—either an abhorrence of the subject or a plethora of information concerning it.

I trust I may not be considered an expert in this line, for I assure you I cannot find a practical illustration of it from my audience. In this, I know you are a body of immunes. If the subject is one at which our professions have touched—or rather, where some of our professions have "touched" some of yours—I am happy to say in vindi-

cation of my own that few if any lawyers of consequence have sought to profit by such causes. If all rational discussion should start with a definition of terms, it must be admitted none can be framed of this subject to fit all as well as each particular case. To tell what malpractice might be under a given state of facts is to assume the province of that "ancient bulwark," otherwise known as our jury system.

There was an ancient doctrine that in order to render a physician liable in a civil action for damages there must have been *gross* carelessness or negligence on his part. This is rapidly disappearing, and in its place the courts are holding, in our State as elsewhere, that a physician or surgeon assumes to use *ordinary* care and skill as such; and if he does not possess such degree of skill, or fails to use ordinary care, by which the patient is damaged, he is liable. Ordinary care has a relative meaning, and means such as a prudent person under the same circumstances would exercise. So then, it may be agreed, that a physician or surgeon is, as a rule, liable for damages when he fails to use ordinary care in the treatment of his patient. Herein appears, what is to a layman an anomalous position for courts to assume, *viz:* the degree of *skill* that may be required of a practician is vastly different in different cases presented, but with the change in the degree of skill comes no corresponding change in the degree of care; ordinary care is required, no matter if the disease be iritis or rheumatism.

One writer upon the subject of "The Jurisprudence of Medicine," says: "It is extremely difficult to determine, with any degree of exactness, what constitutes such a want of ordinary skill as will enable us to establish a general principle applicable to all cases in which a deficiency of it is alleged. Necessarily, every case has its own complexion, and is, in its requirements upon the physician for special forms of treatment, more or less simple or complex. In proportion to the delicacy of an operation, or the difficulty of treating a particular disease, rises the measure of required *skill*. As every disease is modified to some degree by the

constitutional peculiarities of the body in which it manifests itself, it becomes difficult if not impossible to lay down in advance any standard of prerequisite skill, assumed as indispensable to its successful treatment."

One author in his work on the medical profession says: "Want of skill does not mean the want of the greatest possible medical talents or attainments; still less does it signify the having erred in opinion as to the disease, or the mode of treatment adopted; but the want of that general and ordinary knowledge of the profession which the law expects from every man who ventures to proclaim himself a member of it; or a total want of professional skill and knowledge in the particular operation or complaint which he has undertaken to cure."

It is in point here to observe that the question of malpractice must turn, as cited by our own Supreme Court, upon the skill *employed* in the treatment of the particular case, and not as to the skill which the physician *possessed.* One can not be excused by reason of being the most skillful man of his profession, if he has not exercised and employed ordinary skill in the particular case.

The rule as stated by Professor John Ordronaux, who was professor of Medical Jurisprudence in the law school of Columbia College, does not obtain in Ohio. He says:

"What is demanded therefore, in every practitioner, is simply that average amount of skill necessary for the *ordinary duties* of his profession, since this is the minimum that will suffice for its successful practice."

Skill in the ordinary duties of the profession will not exonerate a physician who undertakes an operation or treatment in which he has no skill. It is required that he possess the skill suited to the undertaking, and ordinary knowledge and experience in the treatment of like or similar cases as the one undertaken, or he becomes liable, if damage or injury results from such ignorance. If it were otherwise, all that would be necessary would be to *assert* an experience

or skill, which in fact were not possessed, and the empiric would be protected with the most learned physician.

It possibly is unnecessary to say that the relation implied between physician and patient is not that of an insurer. No promise to effect a cure is implied. If one is averred, it must be shown that there was an express undertaking or agreement on the part of the physician or surgeon to effect a cure. In one of the oldest cases decided in Ohio, the Supreme Court said:

"The surgeon engages the ordinary skill of the profession in reducing a fractured bone, and diligence and care in his subsequent treatment, and to use his exertion and endeavor to cure, but a cure itself is frequently beyond his physical power. It depends not on him. The *accoucheur* engages the skill of his profession, and that he *will endeavor* safely to deliver, but there is no positive obligation to produce this result. The event is in the hands of Him who giveth life, and not within the physical control of the most skillful of the profession."

As to the ethics of "guaranteeing" cures, a topic outside of the range of this paper, there can be but one opinion. The promise is rarely, if ever, prophetic of the performance, and probably the best way to dispose of this altogether-too-numerous branch of the profession is to turn them over as the legitimate prey of the "guaranteed" lawyer.

Puffendorf, in his *Law of Nations,* tells of an instance of this class. A man who had sore eyes came to a horse doctor for relief; the doctor anointed his eyes with the same ointment he used among his horses, upon which the man falls blind and the cause is brought before the judge, who acquits the physician. "For if the fellow," says he, "had not been an ass, *he had never applied himself to a horse doctor.*"

The relation of physician and patient is one which does not discharge from all care the patient himself and yet hold the physician liable for an absence of care. It may be characterized as a mutual relation, in which the patient must

cooperate with his professional adviser, and must conform to the necessary prescriptions; but if he will not, or under the pressure of pain cannot, his neglect is his own wrong or misfortune, for which he has no right to hold his surgeon responsible. In such cases the burden of responsibility is shifted from the physician to the patient, and the former ceases to be accountable for the ulterior consequences of a treatment which, though undertaken by him, has yet been interfered with and interrupted in the course of its execution. This is an eminently just doctrine, and founded upon the maxim that no man shall profit by his own wrong. Nor does it matter in what form that wrong manifests itself, whether it consists in negligence, unwillingness, or inability to follow the physician's directions, or in a wrongful interference with his treatment for sinister purposes. "In probably the largest number of cases of alleged malpractice, could the truth be known, it would be found that deviations and departures from the strict line of duty on the part of patients had been the starting point of a series of mischievous results, for which it is afterwards and unjustly sought to throw the blame upon the physician."

One evidence of the constant advance of your profession is that many of the practices of but a few years since, if resorted to now, would be grounds for recovery in a suit for malpractice. One of your authors has said: "Surgery has just emerged from barbarism." Formerly wounds were not permitted to heal as of first intention; the lips were not permitted to be put together. Simple wounds were forced into sloughing ulcers, and fractured bones were kept separated by thrusting dressings between their ends. With greater learning and the departure from ancient practices has come a more liberal treatment from the courts. This has come naturally, as did the discovery of anesthetics in response to a higher humanity.

As heretofore suggested, the courts of different States have not been uniform in their opinions as to what constitutes actionable negligence or ignorance on the part of

physicians and surgeons. The Supreme Court of Pennsylvania held in the case of McCandless *v.* McWha, that the skill that was required was such "as thoroughly educated surgeons ordinarily employ." This is now denied by the weight of authority. As to what constitutes a "thoroughly educated surgeon" would be left to that eminently qualified body, a petit jury.

The Supreme Courts of the States of Indiana, Massachusetts, Wisconsin, Iowa, and Pennsylvania have held that the locality in which the physician or surgeon practices should be taken into account; and that one living in a sparsely settled district is only bound to exercise the average degree of skill possessed by the profession generally in such locality. This I cannot concede to be the true rule to govern either the profession or the public. It localizes ignorance, and makes it a protection for those who have not acquired and do not care to acquire any higher or greater degree of skill. Ignorance and want of skill should not be made a question of geography.

I hope to see the day come in Ohio when the requirements of the legislative standard are made so high for an entrance to the profession that the very possession of the required certificate will be a *sine qua non* to the world of the skill of its possessor, and that he will only be held bound to give to his patients the results of his best judgment.

To an enlightened bar you are compelled to look for a more charitable judgment upon your actions. You, as members of so noble a profession, can claim no privilege of absolution for wrong-doing. This is more than you ask. Rules of law, which should be certain and definite, must govern all our relations in order to insure mutual protection to the personal rights of each member of society; and surely none would seek, in any profession, to be exempt from the laws which govern all. It was unwise, illogical and wrong to hold the surgeon liable for errors, and to withhold from him the protection of the law in the procurement of material for the dissecting-room. The day of such hysteric legisla-

tion is passing. Your profession is being viewed with more favor by both the legislative and judicial branches of the government. Upon questions affecting your rights and interests the courts are employing the powers confided to them with prudence and moderation, and when they are called upon to intervene between you and the public, to preserve the rights of each, they judge you with caution, not hampering the advance of your science nor delaying its onward progress. To an enlightened bar, and to the wisdom and honesty of the bench, you can safely trust the highest interests of your personal and professional welfare.

The Effect of Rest Upon the Progress of Septic Infections

By A. J. Ochsner, B. S., F. R. M. S., M. D., Chicago

Surgeon-in-chief of Augustana Hospital and St. Mary's Hospital, and Professor of Clinical Surgery in the Medical Department of the State University of Illinois

My subject is so old that it scarcely seems worthy of your attention at this time, for I believe every surgeon will admit at the outset that absolute rest is theoretically one of the most important means to be employed in the treatment of conditions which are due to septic infection. In practice, however, my observations have taught me that this condition of rest is but rarely secured, and but seldom systematically striven for, except in the treatment of inflamed joints; and for this reason it seems worth the effort once more to direct attention to this important therapeutic aid.

In the clinical observation of septic infection in any part of the human body, no feature stands out so prominently as the beneficial effect of rest applied to the part involved. It seems most important for the practical surgeon not to overlook this, because its recognition must point out the proper treatment in many of these cases.

Sepsis is extended by the lymphatic circulation, and to retard as much as possible the circulation of lymph by inhibiting motion of the surrounding structures is an important aid in keeping the sepsis localized, and in causing the infection to subside. If through a free incision the lymph-stream is directed away from the body the infection subsides, the infectious material being no longer in a position to do harm.

These features can be observed most readily in infections of the extremities resulting from pin-pricks, scratches, dissecting-wounds, etc. A most simple infection of this kind may become exceedingly violent, if the patient continues to use the extremity and thus forces the infectious material through the body, for we know that the muscular contractions force the infectious material through the lymph-channels toward the body. The infectious material may progress slowly or it may advance with great rapidity. If, for instance, it is at the tip of a finger, it is very likely to enter the palm of the hand unless the extremity is kept at rest. Further motion, extending over a period of a few hours, may force it into the forearm. In the same manner it may be forced on into the arm and then into the axilla.

Without this pumping of the septic material through the lymphatics by means of muscular contraction, the septic material would have caused the formation of a small circumscribed abscess, which might contain a drop of pus and whose emptying by a slight incision would be followed by a rapid recovery.

In one case the new field of invasion gives greatly increased vigor in the activity of the septic microorganisms; in the other its confinement to a circumscribed location seems to make the microorganism harmless.

Every practical surgeon has made the following observation upon patients many times and probably also upon himself. A slight infection of the finger occurs from a prick with a needle or from some other slight injury. During the day the finger and even the hand become painful. The next morning the pain has entirely disappeared and the patient

imagines himself well; but during the day the pain returns, possibly a little more severe than the day before, and, on the following night, it again disappears, only to a less extent. After a few further repetitions, a serious infection may become established, resulting in the destruction of a considerable amount of tissue, which will probably be followed by a marked impairment of the function of the extremity.

The explanation is very simple. During the day when the extremity is frequently moved the infectious material is carried from its circumscribed area to the points further up the arm. The following night this progress is again inhibited, and there is a corresponding diminution in the symptoms. If the rest is continued, the progress is permanently inhibited, and the patient recovers completely. If this is not done it will ordinarily progress until the patient is so ill that rest is compulsory.

I have had all the histories of cases of serious infection of the hand which have been treated in the Augustana Hospital during the three years from January 1, 1899, to the present time, reviewed (52 cases in all) in order to illustrate this principle. I find that all those cases which came under treatment at the hospital before incisions had been made, recovered without deformity or stiffness of the fingers, while of those which had been treated without being kept at rest, in which abscesses had formed and had been drained by free incision previous to their admission to the hospital, a considerable proportion recovered with more or less deformity, some with very severe deformity and with more or less impairment of function. In the cases that were admitted to the hospital, the treatment consisted in obtaining as nearly as possible complete rest for the extremity, by placing the patient in bed, applying a large dressing composed of sterile gauze and absorbent cotton saturated with a mild antiseptic solution. The solution most commonly employed being hot saturated solution of boric acid, to which one-third by volume of strong commercial alcohol had been added. The whole dressing is covered with oiled silk or rubber cloth. Even in cases

in which only the end of a finger is involved the entire extremity up to the shoulder is included in the dressing. This makes motion of the extremity almost impossible. It is likely that the hot moist antiseptic dressings are beneficial in themselves, but I am positive that the enforced rest is of equally great importance, because if this part is neglected a rapid and perfect recovery does not occur.

The value of this treatment can be seen from the fact that in this entire number of 52 cases there was not one in which the infection was not inhibited in its progress. Moreover there was not a single death, although among this number many patients were brought to the hospital in an extremely septic condition with high temperature and pulse and frequently delirious.

Aside from the treatment by means of enforced absolute rest on account of the large moist dressing, the general hygiene of the patient was always given proper attention. The elimination was encouraged by means of cathartics, and proper nutrition was employed. There can be no doubt but that the moist antiseptic dressing and the hygienic conditions had something to do with securing such satisfactory results, but in cases in which all of these measures excepting rest had previously been employed without benefit, speedy improvement followed as soon as the element of rest was added.

The dressings were never disturbed more than once in 24 hours, and usually they were left in place for two to four days, fresh fluid being poured upon the dressings every six hours.

For a time we attributed most of the good result to the action of the antiseptic fluid which was applied, but I am more and more impressed with the greater part which rest has to do with the improvement of these infections. I have observed frequently that an examination accompanied with much manipulation for the purpose of determining any points of fluctuation would invariably result in an increase in the infection.

I have observed in a few cases that unnecessary manipulation during the changing of dressings by assistants who did not fully comprehend the importance of rest would result in the same increase in the septic conditions.

Many of these patients came to the hospital for the expressed purpose of having an amputation performed in order to interrupt the progress of the septic condition; but this became necessary only in one case, in which a violently septic case of infection of the hand punctured with a dirty file, was brought into the hospital with a gangrenous thumb and two fingers. The infection had been so violent that, although it had existed less than two days, the patient was delirious; his temperature was 105° F., and his pulse 130, still the infection subsided rapidly under this treatment and there was no further progress of the gangrene.

Many other equally striking cases might be added if time permitted, but the important point I wish to impress is shown by the satisfactory results generally which I believe must be attributed largely to the element of rest.

The same principle can be observed in connection with infection of other parts. In all forms of acute peritonitis for instance resulting from an infection from the vermiform appendix, the Fallopian tube, the gall-bladder, or an ulcer of the stomach which threatens perforation, the same principle obtains.

In all these cases it can be observed easily that the infection is greatly exaggerated by motion. So long as the infectious material is in the vicinity of its original location the patient is not very seriously ill whether this be about a Fallopian tube, an appendix, a gall-bladder, or the stomach; but so soon as it is carried away from its original location either by the lymphatic circulation or by mechanical means the conditions are at once entirely changed.

In these cases it is, however, the mechanical distribution which is most mischievous, because of its splendid facilities. A surgeon who has experimentally placed a small piece of gauze in the abdominal cavity among the small intestines of

an animal and has in a short time attempted to find this has usually discovered great difficulty because it may have been carried to any part of the abdominal cavity by the motion of the small intestines. It is just so with the septic material which has come in contact with the small intestines, if their peristalsis has not been inhibited.

We have had an excellent opportunity to observe these conditions, especially in patients suffering from peritonitis—following criminal abortion—which are brought into the hospital. Some years ago we systematically gave these patients large doses of saline cathartics, curetted, irrigated, and disinfected the uterine cavity, and this resulted in the death of quite a large percentage. This method of treatment had been highly recommended, but it did not contain the necessary element of rest, the saline cathartics having exactly the opposite effect. The unsatisfactory results and an appreciation of this principle caused us to abandon this form of treatment.

During a number of years since that time our plan of treatment has consisted in keeping these patients positively at rest. This is accomplished by removing any contents of the stomach by means of gastric lavage, and then placing the patient on exclusive rectal alimentation. The difference in the mortality has been most marked. It has been reduced to almost nothing.

I refer here to the typical case of peritonitis following criminal abortion. Some midwife has produced criminal abortion. The patient has been infected, she is cared for by the abortionist until the latter becomes frightened, then she is sent into the hospital. When she arrives her abdomen is severely distended, her facial expression is bad, she complains of severe pain in the abdomen, there has been complete obstruction to the passage of gas, her temperature is from 102° to 106° F. and her pulse from 110 to 160. In former years we immediately anesthetized the patient, curetted and irrigated the uterine cavity, gave large and frequently repeated enemas, administered saline laxatives in the hope of

overcoming the intestinal obstruction, administered alcoholic and other stimulants, and expected the patient to die in from two to four days.

Now we simply apply the one principle of rest. The pharynx is sprayed with a 4% solution of cocain, and gastric lavage is performed in order to wash away any food or mucus which might give rise to peristaltic motion of the small intestines.

The obstruction to the passage of gas being looked upon as a result of the disease and not a cause, and being in itself favorable to the production of rest, is not disturbed either with cathartics or food. An ounce of one of the various concentrated liquid foods in the market mixed with three ounces of warm normal salt solution is given as a nourishing enema through a soft-rubber catheter inserted two inches every four hours. A hot poultice or an ice coil is applied to the abdomen to increase the patient's comfort. If necessary morphin is given hypodermically to relieve the pain; this is, however, but rarely necessary if neither food nor cathartics are given by mouth.

Aside from this the patient is given a hot vaginal douche every three hours, and gauze pads saturated with equal parts of alcohol and hot water are applied over the external genitalia and covered with absorbent cotton and a bandage. The alcohol dressing is applied fresh after each douche. I mention these last steps because they are carried out as a matter of routine. It is likely that they are of no special importance, their use being based entirely upon a superstition which I have received from one of my chiefs in the early days of my professional existence. The beneficial effects of the douche might easily be explained by the fact that they favor drainage, and those of the pads by the fact that the moist warm pads are agreeable to the patient and that the alcohol has antiseptic properties.

Clinically I can state that a class of patients which gave an exceedingly high mortality before this method was employed is now almost without any mortality. Within 24 hours the

temperature is usually below 100° F., the pulse has decreased correspondingly in frequency, the abdominal distension is subsiding, the pain has entirely disappeared, and the patient's appearance is no longer that of an extremely sick person. After two or three days the patient is usually nearly normal in every way. An examination will still demonstrate the presence of an induration in the pelvis which may absorb entirely or an abscess may form, but there is no longer a tendency toward extension of the inflammation.

All that has been accomplished is the result of rest in the vicinity of the inflammation. The infectious material has not had an opportunity to be carried to all parts of the peritoneal cavity. Whatever explanation we may desire to make, the fact remains that many patients who would ordinarily die within a few hours under what might be called vigorous active treatment will recover regularly under this form of passive treatment.

During the war in South Africa the surgeons have found the same clinical facts to obtain in penetrating wounds of the abdomen. If the patient was wounded while hungry and no food was given by mouth, quite a large proportion of the patients recovered, while of those in whom the alimentary canal was not kept empty none recovered.

In severe local peritonitis accompanying attacks of gall-stone colic the condition becomes localized, and absorption will take place if peristalsis is inhibited by abstaining from food by mouth. I have repeatedly observed that pain which would not subside after the administration of from one-fourth to one grain of morphin would disappear upon performing gastric lavage and prohibiting the use of food and cathartics by mouth in patients suffering from gall-stones. The same clinical condition can be observed to a still more marked extent in the presence of severe localized peritonitis due to the presence in the peritoneal cavity of a perforated or gangrenous vermiform appendix. This is true even in

cases in which the peritonitis is progressive at the time the treatment is instituted.

If complete rest is obtained by removing any food or mucus which may exist in the stomach by means of gastric lavage and then prohibiting the use of food and cathartics by mouth, the inflammation will regularly remain circumscribed in the presence of gangrenous or perforative appendicitis, while it will as regularly become diffuse if these precautions are not taken, unless at the same time the local cause of infection, the appendix, be removed and free drainage of the peritoneal cavity instituted.

Many other instances of this principle can be mentioned, such as the result of strapping in the treatment of mastitis during the beginning of the attack, the use of the splint or plaster-of-Paris casts in inflamed joints, strapping of the chest with rubber adhesive straps in pleurisy, a dark room and bandaging of the eyes in conjunctivitis, etc.

What I wish to emphasize particularly is the fact that the element of rest should be borne in mind constantly with treatment of all forms of inflammatory conditions in any part of the human body.

DISCUSSION

Dr D. N. Kinsman, Columbus: I am of the opinion that the Ohio State Medical Society is to be congratulated upon having Dr Ochsner present this subject in this clear and conclusive manner. It is an application of the principles which we learned long ago in Hilton's "Rest and Pain." This is a matter which is very close to me. It gives me great pleasure to testify at this time to the great amount of instruction which I have received from this paper. It would ill become me to try to discuss this matter, but I do wish to say that this paper is an evidence that the profession is exercising common sense in the matter of operative surgery, and that the "*furor secondi*" is abating.

Dr S. S. Thorne, Toledo: The pendulum swings away off to the left and back again to the right. In Dr Ochsner's address this afternoon we have had brought prominently before us an actual and practical demonstration of the principles advocated years ago by Hilton in his book on "Rest

and Pain," so the pendulum has swung back from the extremes of operative surgery to a practical noninterference treatment. Hilton's book is one of the greatest ever published, but the most wonderful book and only equalled by Williams' Theory and Practice of Medicine. That is the greatest book in the English language. We old fellows who were here before the Indians remember this book, and if some of us do not, we certainly have read of the old Sydenham treatment. Sydenham started the ball in reference to the intestinal tract, and backed up by Hilton, has made possible what we have here today. The old man who opened the eyes of all of them and went back to his treatment was one of the old fellows who was here when I came, about the time the Indians came. I want to thank Dr Ochsner for having grabbed on to the opportunity. That is what made the men of old, they had an idea and they grabbed on to it. That is what Dr Ochsner has done. Go back and read for your own satisfaction what Sydenham has to say on the subject and you will find how much you are still in touch with him. Empty the intestinal tract, give absolute rest, put the two together and we have what Dr Ochsner has given us this afternoon.

The Present State of our Knowledge of Diabetes Mellitus

By James Tyson, M. D., Philadelphia

Professor of Medicine, University of Pennsylvania

I have often said that I know of no morbid condition about which so much knowledge has been gathered from the clinical and experimental stand-point, and of which we actually know so little, as diabetes. I emphasize clinical and experimental because, although morbid anatomy has contributed to our knowledge, it has added less than the other two sources mentioned.

The diabetic problem may perhaps be best stated as follows: A man has been subsisting upon an ordinary mixed

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diet as commonly constituted, and has maintained his usual health. The carbohydrate and proteid foods have been appropriated, with the production of force variously manifested and in the maintenance of the tissues and organs of the body in their normal state. The blood and urine have been free from sugar, at least to the ordinary tests. A little later, while consuming the same food, containing the same quantity of carbohydrate, the man acquires glycosuria and other symptoms of diabetes. Thus without increasing the ingested carbohydrate the glycosuria appears.

What has happened to this person? How does his condition differ from what it was previous to this change in carbohydrate metabolism? Is it because more sugar is poured into the blood, or is it because that which is normally passed into the blood current is not consumed in the usual manner? We may be helped to a conclusion by reviewing some of the facts of normal sugar metabolism.

It is very well known that during life there is constantly being produced and stored in the liver and muscles of man and the lower animals an amyloid substance, which was named glycogen by its discoverer, Claude Bernard. Its formula is $C_6H_{10}O_5$—that of starch—and the term zoamylin, or animal starch, also suggested for it, is equally appropriate with glycogen. The glycogen formation takes place whether animal or vegetable food is taken, but it is much more abundant upon a vegetable diet. It used to be held that it does not occur at all with a diet of pure fats, but Salomon some time ago claimed that it is produced in the livers of rabbits fed on olive oil, and it is now acknowledged that a very small quantity of glucose may thus arise. All physiologists agree that the amyloid substance is derived mainly from the starchy and saccharine principles of food, but partly also by a splitting up and rearrangement of the elements of proteid substances, resulting in urea—a soluble, diffusible substance which passes into the blood and is excreted—and glycogen which is stored in the liver cells and muscles. Schultzen has shown that urea is a final

product, being preceded by glycocin, leucin, and tyrosin. Both the circulating and fixed albumins are capable of this conversion, but in health it is probably limited to the circulating albumins.

The most important property of glycogen is its ready convertibility at the temperature of the body into glucose, dextrose, or grape sugar. For this is required also the action of a diastastic ferment contained in the blood and to a less amount in the liver. The source of this ferment is not certainly known. It may arise in the liver or in the pancreas. It is, however, not the pancreatic juice. It is more likely to be an internal secretion like that of the thyroid, which is supplied to the blood by the pancreas (and possibly suprarenal body). Bernard himself claims to have isolated such a ferment from the liver, and assumed that it was contained in only a certain number of the liver cells, while glycogen was found in the others, nervous influence regulating the action of the two on each other. Thus Bernard was apparently the first to isolate an internal secretion.

According to Bernard and his school, the conversion of starch into glucose is constantly taking place during life, and there is as constantly being passed into the blood of the hepatic veins grape-sugar, which is carried through the heart and lungs and finally oxidized in the cells of the body, it being held by him that there is less sugar in venous than in arterial blood. The mean difference is put at 0.3 per 1,000; the minimum difference being 1.10 per 1,000 for arterial and 1.08 for venous blood, the maximum being 1.51 per 1,000 for arterial and 0.95 for venous blood. It was at one time thought that the oxidation takes place wholly in the lungs, but at the present day this view is held by none. It is in the ultimate cells generally, and more especially in those of the muscles, that the carbohydrates are utilized, with the evolution of latent energy in some form of force.

Experimenters and clinicians are generally agreed upon these facts as stated, and that it is a derangement of the normal metabolism which results in diabetes and the loss of the

advantage which accrues to the body from the use of carbohydrate and, to a certain extent, also of proteid food. Studies succeeding Bernard's original announcement, have further elaborated our knowledge, but leave untouched the proposition that the normal glycogen originates from the sources named—namely, the carbohydrates of the food, the proteids of the food, and to a trifling degree perhaps the fats of the food. It is chiefly in seeking an explanation of derangements of this important function resulting in glycosuria that workers are occupied at the present day, for such explanation will solve the problem, as yet unsettled, of the pathology of diabetes.

An important contribution to our knowledge which explains a few of the milder cases of diabetes—or, as some prefer to call them, simple glycosuria, because they are not attended with the more serious symptoms of diabetes—pertains to alimentary glycosuria from unassimilable carbohydrates. This is well explained by Dr F. W. Pavy, to whose industrious investigations we are much indebted, and especially for his great work on the *Physiology of the Carbohydrates.* Dr Pavy holds that in health a considerable portion of the carbohydrate ingested is converted by the cells of the villi of the intestinal mucous membrane into fat, and carried thence by the lacteals to the blood. Another portion is split up, "incorporated with nitrogenous matters and carried away in the form of proteid" by the agency of the same cells of the villi. He considers that the carbohydrates of our food must be appropriated in this way to a far greater extent than has hitherto been supposed. According to him, only the carbohydrate not thus assimilated passes to the liver, and is converted into glycogen in the manner described, the cells of the liver picking out the sugar, dehydrating its molecules, and condensing the monosaccharid to the polysaccharid state. "The office of the liver," according to Pavy, "is thus supplementary to the assimilative work performed elsewhere. If the latter work is efficiently performed, none is left for the liver to accomplish. It is the sugar that is permitted to reach

the portal vein that is taken by the liver, and it may happen that none reaches it in health."* At any rate, according to this view, there is normally a very slight amount of sugar in the blood, which Pavy's experiments show to be about the same in venous and arterial blood—0.09 of one part in 1,000. Corresponding to him also there is always in health a small quantity of sugar in the urine—0.5 part per 1,000—too small to be detected by ordinary tests, and therefore of no clinical importance. It is said, however, to be easily recognizable by special clinical methods, as was long ago claimed by Brücke. As this assimilative power is limited, an excessive ingestion of carbohydrates oversteps it, and glycosuria results. For the production of such a glycosuria sugar is more effective than starch. In a perfectly healthy subject, according to Naunyn, starchy food may be given to a practically unlimited extent without producing glycosuria, and if glycosuria follow the ingestion of starch it should be considered that assimilative power is below normal. This view implies, too, that the capacity of the liver to convert glucose into glycogen is limited, because only the unassimilated carbohydrate which fails to be converted into glycogen passes on through the liver to the general circulation, and is eliminated by the kidneys, producing glycosuria. It is evident at once why the simple omission of sugar from the dietary of such a case will at once remove the glycosuria, and also why such cases of glycosuria are unattended by the more serious symptoms of diabetes.

Those who do not accept Pavy's view as to an assimilative power in the cells of the villi of the intestine hold that in health all the glucose absorbed into the blood from the intestine is converted by the liver into glycogen, but all agree that the ingestion of carbohydrate may be so excessive that the liver is unable to convert all the resulting glucose of intestinal digestion into glycogen, and that thus there may arise an abnormal glycemia and resulting glycosuria.

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*See Dr Pavy's most recent paper, entitled Experimental Glycosuria, *British Medical Journal*, Oct. 12, 1901.

Up to this point we have been dealing with alimentary glycosuria, and, in point of fact, it may be said that we have scarcely touched upon the conditions of the proposition stated at the outset, according to which we suppose that our patient has been transformed into a diabetic while upon the same diet upon which he subsisted prior to this change. It is evident, too, how this milder form of diabetes may be aggravated if, in addition, the assimilating office of the liver is deranged and all the absorbed glucose passes directly through the liver into the general circulation. Thus, again, the sugar from ingestion is not stopped from reaching the general circulation as it ought to be. As militating somewhat against this dominating influence of the liver in health should be mentioned the fact that glycosuria does not seem to be caused by such destructive diseases of the liver as acute yellow atrophy and carcinoma. On the other hand, such unnatural transit through the liver may be reasonably ascribed to vasomotor influence causing the blood to move too rapidly through the liver to permit the primary conversion of carbohydrate into glycogen, which seems to be a necessary condition to its proper metabolism.

So much for the presence of sugar in the blood due to the imperfect conversion of the ingested carbohydrate into glycogen. It is also evident that glycosuria may be the result of an abnormally rapid transformation of glycogen into sugar. Glycogen is a product of assimilated carbohydrate, whence it is derived through the operation of living protoplasm. On the other hand, by enzymic and other means it is readily broken down and hydrolyzed into the sugar molecules from which it was constructed, and if this conversion is too rapid to permit a complete consumption of the sugar, glycemia and glycosuria may be produced. It has been said that the liver and muscles are the chief storehouses of glycogen accumulation. Pavy has found as much as 16.67 per 1,000 in the general muscles of the body of a dog—7.72 in the heart and 29.59 in the diaphragm. Inactivity favors the storage of glycogen; forced exercise its virtual disappearance from the

liver and marked reduction in the muscles. As to the method in which glycogen becomes stored in the muscles, it is thought that the muscle cells, like the liver cells, may by their "protoplasmic action" construct glycogen out of glucose absorbed from the intestine, and perhaps also absorb from the blood glycogen constructed in the liver.

Pflüger and his assistant Nerking, on the one hand, and Pavy on the other, apparently quite independently, suggested that glycogen exists in feeble combination with nitrogenous matters in the shape of a nitrogenous nucleus, from which the sugar may be oxidized through the operation of a diastatic enzyme without disturbing the nucleus. Under normal conditions the storage of glycogen is maintained without leading to a formation of sugar resulting in glycemia and glycosuria. Bernard's puncture may be regarded as one of the deranging influences which disturbs the normal equilibrium. The same is true of operations on the sympathetic. On this source of glycosuria Bernard placed especial stress, believing that in diabetes the amyloid substance is too rapidly converted into glucose to be consumed in the ordinary processes of oxidation, and therefore appears in the urine; so that in all instances of diabetes except of the cases of alimentary glycosuria referred to, he held the excess of sugar in the blood to be derived from glycogen, the result of an exaggerated sugar formation rather than a diminished destruction. At the present day, however, the tendency of thought seems to be to ascribe the glycosuria of essential diabetes to agencies which diminish its oxidation or destruction rather than those which cause its overproduction.

I have alluded to some influences of the nervous system upon the production of glycosuria. Let us follow them a little further. Bernard early discovered that by puncturing the medulla oblongata in the floor of the fourth ventricle anywhere between a point four or five mm. above the nib of the *calamus scriptorius*, and another about four mm. higher up, the urine in a day or two acquired a considerable amount of sugar, and was increased in quantity. This is the celebrated

picûre experiment. The amount of sugar is larger the better fed the animal, while if all food is removed the sugar is trifling in amount or disappears altogether from the urine. The point thus punctured corresponds with the origin of the roots of the pneumogastric nerves, hence it was supposed that the diabetes was the direct result of irritation of these nerves; but it was found on section of the vagus that galvanization of the distal end of the cut nerve produced no effect, while the same irritation applied to the *central* end resulted in glycosuria. Stimulation of the depressor nerve by Lafont and Filehne also produced glycosuria. Whence it was learned that the pneumogastric was not an excitor, but a sensory nerve of diabetes, and that the glycosuria produced by irritation of the roots of the vagi or their central cut ends is the result of a reflex action called into play through the pneumogastric as a sensory, and some other nerve—probably the sympathetic—as a vasomotor nerve.

Following these early discoveries of Bernard, instances of the effect of nervous lesions producing glycosuria multiplied rapidly. It would be unprofitable to attempt to detail them. Among them may be mentioned destructive lesions of the pons and posterior crura of the cerebellum, section of the optic thalami and great cruri cerebri, section of the medulla oblongata and of the cord above the second dorsal vertebra—that is, above the lower end of its cervical enlargement. Section of the cord below this point is without effect, while glycosuria again ensues on extirpation of the superior cervical ganglion and of the first thoracic ganglion, and on section of the sympathetic chain ascending thence and accompanying the vertebral artery. Schiff also produced glycosuria by section of the sciatic nerve, while from the clinical standpoint Rosenstein called attention to the combination of glycosuria with sciatica, limited to the peroneal and tibial nerves, ascribed this effect to a hyperemia of the abdominal organs, and says that treatment directed to the latter relieved the former.

It is evident from the above that the glycogenic function of the liver is influenced through the vasomotor nerves transmitted in the upper spinal cord and the sympathetic nerve. It does not matter for our purpose what the exact route of the impressions is beyond what has been stated. It is evident that any lesion in any part of the nervous system affecting this route directly or indirectly, may produce glycosuria. Such influence may be exerted upon the ends of the peripheral nerves as well as upon the nerve centres and great tracts. It may be supposed that the effect is to produce undue dilation of the bloodvessels of the liver, which allow a flow of blood through the organ too rapid to permit the normal conversion of glucose into glycogen. On the other hand, such rapid movement of the blood may overstimulate the reconversion of glycogen into glucose.

Let us now turn to other lesions which produce diabetes. Attention was attracted to disease of the pancreas associated with diabetes as far back as 1788, when Cowley published a case of severe diabetes associated with pancreatic calculus and atrophy of the gland. Since then an enormous amount of evidence has been accumulated from experiments on the lower animals and clinico-pathologic observations on men. For some time previous to 1890, experimenters endeavored to arrive at an explanation of this evident relation of pancreatic disease to diabetes mellitus by experiments consisting in extirpation of the pancreas, section of its nerves, and ligation of the pancreatic duct; but nothing was accomplished until in that year Von Mering and Minkowski took up the subject anew from the experimental standpoint. They showed conclusively that extirpation of the pancreas in the dog, cat, rabbit, toad, and frog produces, without exception, glycosuria with the other symptoms of diabetes mellitus—hyperglycemia, ravenous appetite, thirst, emaciation, and death. The condition is comparable to the severest cases of diabetes in man, because glucose continues to be excreted after all carbohydrate food is withdrawn. In the dog the proportion of sugar in the urine is very large—10 per cent. being not un-

usual, while 16 and 22 per cent. is sometimes attained. As in the human being, toward the end, when the emaciation is extreme, the proportion of sugar falls, and diacetic acid, acetone, and oxybutyric acid appear in the urine. So, too, the maximum elimination of sugar appears with a carbohydrate diet, and grape-sugar is almost completely secreted as such. Even on an albuminous diet five and six percent is eliminated. Starvation diminishes it still more, but does not remove it. Partial extirpation of the pancreas of animals does not necessarily produce diabetes, but as larger and larger pieces are removed, diabetes appears, first in a mild form, which generally grows worse until it terminates fatally. Like results follow, though not invariably, injection of the pancreatic duct with warm paraffin, which congeals on cooling and leads ultimately to complete destruction of the gland. Mention should also be made of the fact that in experiments by Flexner and Pearce injection of gastric juice into the pancreatic duct was followed in thirty minutes by glycosuria.

As I have already said, the diabetes that succeeds extirpation of the pancreas is fatal. No other organ seems to be able to replace its function. How far are these results sustained by observations in man? The human pancreas has never been totally extirpated, but it has been partially removed, and diabetes or glycosuria has supervened, not always immediately, and in one instance referred to by Flexner not until one and a half years after operation. So, too, necropsy has disclosed lesions of the pancreas; but, unfortunately for what seems at first a most promising theory, not every case of diabetes that has come to autopsy exhibits recognizable pancreatic disease. Lancéraux was the first to formulate any relation between diabetes and disease of the pancreas. He designated such cases as *diabéte pancreatique*, *diabéte maigre*, or lean diabetes, from the fact that its subject was usually lean or emaciated. Hansemann found alterations in the pancreas in 40 out of 54 cases, or in about 75% of the cases of diabetes which came to autopsy. Wind-

found the organ diseased in 74 out of 139 cases; Frerichs in 12 out of 40 cases; Seegen in 17 out of 92 cases. Naunyn, on the other hand, found the pancreas diseased in only one out of 40 cases, and, moreover, suggests that some of the atrophied pancreases found associated with diabetes may be a result rather than a cause. Taking up the question from the other side, Dieckhoff found that out of 19 cases of pancreatic disease seven had diabetes. In a study of the records of the Berlin Pathological Institute, tabulated for 10 years, Hansemann found 40 cases in which diabetic and pancreatic disease were associated, eight cases of diabetes without pancreatic disease, and 19 cases of pancreatic disease without diabetes. In 99 cases of disease of the pancreas studied by Hale White there was diabetes in 13. For the present we will omit all details as to the nature of the disease of the pancreas further than to say that calculi, pancreatic atrophy, and pancreatitis are conspicuous. It is, however, interesting to note that carcinoma of the pancreas is comparatively rarely associated with diabetes, and that when the latter is present it may disappear as the carcinoma advances, as well as that cases have been found of apparently complete cancerous destruction of the pancreas without any glycosuria. The same is true of seemingly complete destruction of the organ by pancreatitis. That there is some relation between diabetes and disease of the pancreas is, however, evident; but in view of the large number of diabetics in which no lesion of the pancreas is discoverable, one of two conclusions is inevitable—either there occur cases of diabetes in which there is no pancreatic disease, or the lesions in this organ are not recognizable by ordinary methods of examination. The studies of Eugene L. Opie on the relation of diabetes mellitus to certain forms of interstitial pancreatitis and to hyaline degeneration of the Islands of Langerhans in the pancreas[1] are in the direction of

[1] "On the Relation of Chronic Interstitial Pancreatitis to the Islands of Langerhans and to Diabetes Mellitus," *Journal of Experimental Medicine*, 1901, vol. v., p. 397; and on "The Relation of Diabetes Mellitus to Lesions of the Pancreas—Hyaline Degeneration of the Islands of Langer- *Ibid.*, vol. v., p. 527.

such minuter change of which our knowledge may be still further extended.

Lesions of the liver unassociated with pancreatic disease have also been found to accompany glycosuria. Among these is occlusion of the common bile-duct, permanent or temporary. Some experiments made a good while ago by J. Wickham Legg, a report of which I have not been able to find, go to confirm this statement. It has been suggested that suffusion of the liver with bile causes the conversion of the stored-up glycogen after which no further formation of glucose succeeds upon the *picûre* experiment.[1] Cirrhosis and trauma are named as associated with glycosuria, but such association is not so frequent but that it may be regarded as accidental. So, too, diabetes is said to have been found associated with congestions of the liver due to chronic vascular and heart disease. On the other hand, as already mentioned, the most extensive destructive diseases of the liver, such as acute yellow atrophy and carcinoma, are unattended by glycosuria. The rôle of the liver, therefore, independent of vasomotor influence, cannot be regarded as very important. Many believe that glycosuria apparently due to liver disease is really due to associated pancreatic disease.

The part played by the kidneys in producing glycosuria is still more limited. Apparently these organs possess up to a certain point the power to hinder the transudation of glucose from the blood, perhaps by the agency of the renal epithelium. Certain substances may diminish this hindering capacity. Such a substance is phloridzin, which has the effect of favoring the transudation of glucose from the bloodvessels of the kidney. In certain animals this resistant effect of the renal epithelium is so great that even when hyperglycemia is induced by removal of the pancreas no glycosuria results. This is the case with birds. Jacobi has shown that glycosuria follows the administration to rabbits of such substances as

[1]This explanation does not seem clear, but in the absence of a statement of the original experiments and conclusions it must remain so at present.

diuretin and theobromin, which injure the renal cells; and it has been suggested that diseases which injure the renal epithelium, like Bright's disease, may cause glycosuria. I have occasionally seen Bright's disease associated with diabetes, but I have never had any reason to believe that Bright's disease caused the diabetes.

Much more important are the observations on the suprarenal capsule, from which have been learned the following undisputed facts: (1) That in a certain number of cases of suprarenal disease glycosuria has been present; (2) that bronzing of the skin analogous to that which occurs in Addison's disease is occasionally found in diabetics (bronzed diabetes); (3)* that an intimate relation exists between the normal destruction of sugars and the formation of the bile-pigments and their congeners, the abnormal pigments; (4) that subcutaneous injections and injections into the peritoneum of animals of suprarenal extract is followed by glycosuria, and that in like manner adrenalin chlorid, a substance derived from the adrenals, has the ability to cause glycosuria when injected into the peritoneum or painted in weak solution over the pancreas.

The history of the discovery that the suprarenal capsules contain a powerful substance capable of producing the effects last mentioned is very interesting to Americans. In the latter part of 1901 Blum announced in his paper, "Ueber Nebennierendiabetes,"[1] that the urine of animals subcutaneously injected with an extract of fresh suprarenal gland regularly contained sugar even when the diet of the animals had been free from carbohydrate. In Europe this discovery was confirmed by G. Suelzer[2] the same year, and in America by Alfred C. Croftan, whose paper, "Concerning a Sugar-forming Ferment in Suprarenal Extract," was published in *American Medicine,* January 18, 1902. He announced that

* Croftan, A. C. Some experiments on the formation of bile-pigment and bile acids. *Philadelphia Medical Journal*, Jan. 11, 1902.

[1] *Deutsche Archiv fuer klinische Med.*, 1901, Band lxxi, Heft 2 and 3, p. 146.

[2] Zur Frage der Nebennieren Diabetes, *Berliner klinische Wochenschrift*, 1901, No. 48, s. 1209.

the suprarenal capsules contain a substance which either causes the formation of sugar or inhibits the normal destruction of sugar.

Most important in this connection are the studies of C. A. Herter, announced in a preliminary communication published in the *Medical News,* February 1, 1902, on "Experimental Glycosuria from Adrenalin Chloride, and its Relations to other Forms of Glycosuria Dependent on the Action of Reducing Substances on the Cells of the Pancreas," and in full read before the Association of American Physicians at its meeting in Washington, May 29 and 30, 1902. In this communication Herter presents evidence to show that many and probably most forms of glycosuria and diabetes are due to the action of substances or conditions which interfere with normal oxidation in the cells of the pancreas. This conclusion is based on the effect which succeeds painting on the pancreas a solution of adrenalin chlorid, *viz.,* a glycosuria of transitory character, with corresponding glycemia, while no glycemia or glycosuria follows a similar application to the liver or spleen. On the application of the solution the pancreas becomes deep red in color, contrary to expectation, because of the well-known blanching effect of suprarenal capsule substances. On the other hand, after adrenalin chlorid undergoes oxidation it loses its ability to cause glycosuria and to raise blood-pressure. Similar effects are produced by other reducing substances, such as sulphurous acid, ammonium sulphid, illuminating gas, carbon monoxid, benzyl alcohol, pyrogallol, piperidin, and, to a much less degree, sulphuretted hydrogen and pyridin. On the other hand, solutions of ferric chlorid, of sodium chlorid, and of sodium hydroxid, chlorin water, bromin water, hydrochloric acid, chromic acid, potassium chlorate, and ammonium alum have no such effect. In the preliminary communication referred to, published with A. N. Richards,[1] Herter says the observations made by them

1 *Medical News*, February 1, 1902.

on the action of adrenalin in producing glycosuria are opposed to the idea that the suprarenal glycosuria is connected with a diastasic ferment stored or formed in the suprarenal gland, as announced by Croftan. They further announce that adrenalin injections are sometimes followed by destructive lesions of the gastroenteric tract and pancreas; also that after a fatal dose of adrenalin the cells composing the islands of Langerhans were found to be the seat of granular degeneration, very pronounced in some places. The nuclei of many of these cells showed extensive loss of chromatin substance. In some parts of the pancreas the cells of the islands of Langerhans were much more injured than the surrounding cells of the secreting acini. These observations confirm those of Opie referred to. Interference with the cell activities which are concerned with the production of an oxidizing enzyme is apparently largely responsible for the diabetes, the effect being similar to that produced by poisoning with hydrocyanic acid, when the blue, venous blood is changed to bright, arterial blood. With equal doses of adrenalin, intraperitoneal injections proved much more efficient in the production of glycosuria than injections under the skin.

Recently Croftan has repeated the experiments of Lepine in search of the glycolytic ferment, and published results in the *American Journal of the Medical Sciences,* April, 1902. It should not be forgotten that Lepine is the father of the glycolytic ferment, although, as already stated, Bernard claims to have isolated a ferment from the liver many years earlier. I remember Lepine at the meeting of the Tenth International Congress, in Berlin, in 1890, where he made some remarks on the glycolytic ferment. In his recent experiments Croftan confirmed the presence of a sugar-destroying ferment in the blood and in the lymph, and located it in the white cells. Croftan also confirmed Lepine's observation that the glycolytic power of the blood was considerably reduced after the removal of the pancreas, although a number of investigators after Lepine denied this; then Croftan sought

to isolate a substance from the pancreas which could act as a glycolytic ferment. The known ferments of the pancreas—trypsin, amylopsin, steapsin, and a variety of preparations of pancreatin—may remain in contact with sugar solutions for months without causing any loss of sugar. He ascertained, however, that trypsin in the presence of hemoglobin does possess glycolytic powers; and he has, moreover, been able to isolate a glycolytic ferment from the blood which possessed the same properties as trypsin, whence he concludes that "until proof to the contrary is forthcoming we are justified in declaring that the glycolytic ferment of the blood and tissues is none other than trypsin."

These statements above include the most important of the facts I believe, at present acknowledged as bearing on diabetes. To sum up, first, the glycogenic function of the liver is admitted by all observers and experimenters. Pavy, however, assigns less importance to this function in health than did Bernard, Pavy holding that only such glucose as escapes the assimilating action of the villi of the small intestine is converted into glycogen, while Bernard held that in health all the glucose formed in carbohydrate digestion is converted into glycogen, stored in the liver and muscles, and gradually reconverted into glucose in accordance with the needs of the economy.

According to Pavy, it is only in the event that the ingestion of sugar is too large or the protoplasmic action of the cells of the villi is interfered with that more glucose may pass on to the liver than can be converted by the latter organ into glycogen, thus producing an abnormal glycemia and glycosuria.

According to Bernard, it is the too rapid reconversion of glycogen into glucose which is the fundamental condition of diabetes. At the present day the disposition is rather to lay the blame on a defective oxidation of sugar, itself due to deficiency of the diastasic ferment or interference with normal oxidation in the protoplasm of the pancreatic cells. From the clinical standpoint, however, it would seem that there must

arise conditions in which, too, the amount of glucose produced is increased. May it not be that in such cases the nervous system plays the rôle which it must somewhere play, as evidenced by the results of the *picûre* experiment and the numerous lesions of the nervous system associated with glycosuria? Nervous influence may act upon the pancreas as well as the liver.

There would seem, therefore, to be:

1. An alimentary glycosuria due to an imperfect assimilation of carbohydrate into fat and proteid in the intestinal villi, as a consequence of which it passes over into the portal circulation more rapidly than it can be converted into glycogen by the liver.

2. A glycosuria due to the overproduction of glucose out of hepatic glycogen.

3. A glycosuria due to defective oxidation of glucose. For such deficient oxidation, derangement of the function of the pancreas may be responsible, either by disease or by interference exerted by deranged suprarenal function.

4. There remains, however, another source of glycosuria which adds greatly to the complexity of the problem, and is the indication of the most intractable stage of the disease diabetes mellitus, *viz.*, glycosuria arising from the disruption of proteid, with the liberation of glucose. This is seen in the last stages of the disease, when even a pure proteid diet is attended with free excretion of glucose by the urine. Nay, more; at this stage even the fixed proteids of the tissues yield to the inexorable demands of the economy for glucose for needs which it is still unable to supply because of defective catabolism, and what is really a starvation results, with rapid emaciation, great debility, and death as its terminal event, unless this is precipitated earlier by the acid toxins, *viz.*, acetone, diacetic and oxybutyric acids which follow in the wake of defective glycolysis.

As has been stated, the tendency of modern thought is toward defective oxidation as the cause of abnormal glycemia and glycosuria. It may be that the pendulum has been

allowed to swing too far in the direction that diabetes is due to the action of conditions or substances which interfere with normal oxidation; but it would seem that we are on the threshold of events which will lead us to a more accurate knowledge of the pathogensis of diabetes, without which a rational treatment is impossible.

Naturally, our thoughts revert to suggestions for treatment which grow out of these late discoveries. It is too early to expect much; but evidently, if these latest views are correct, our search for curative treatment must be directed more than it has been in the past to measures that aid this oxidation. Let us review the condition on which the existing diabetic treatment is based. Carbohydrate food is withdrawn wholly or in part, the idea being that the increased amount of proteid food taken under these circumstances will make up for the carbohydrate withdrawn. It is evident that any tendency to actually cure thus brought about must depend upon the possibility that a temporary cessation of the glycogenic and glyco-destructive offices of the economy may lead to a restoration of function; and this may happen in some cases, but it must be in the mildest cases only, because it is these alone in which proteid foods and the fixed albumins are untouched.

It seems reasonable, therefore, that while availing ourselves of the dietetic treatment for its important palliative effect, we should also seek remedies which will increase the oxidation of the glucose thrown into the blood from the liver, so long as we are not in a position to restore the normal combustion, for by such oxidation only can glucose be converted into energy and some form of force; otherwise it must pass through the economy unappropriated and useless.

Now, as to the measures which stimulate oxidation: arsenic has long been regarded as a remedy in diabetes mellitus, and with reason; but the difficulty in the way of explaining its good effects has always deterred many from using it. We know now that it increases the number of red blood disks and the quantity of hemoglobin in them, and thus facili-

tates oxidation, operating in the way the above reasoning suggests. I have had some experience in the use of arsenic, and I think I have learned the method by which to make it most effectual, and that is by administering small doses, long and uninterruptedly continued, instead of large doses sufficient to produce its toxic effect. It is true of arsenic, as of all remedies, that it is useful chiefly in mild cases. The dose must not exceed three drops three times a day for Fowler's solution, and one-thirtieth grain as often of arsenious acid.

Are there other remedies which have a similar effect? Iron is one of these, and although I am unable to point to any direct result in the use of iron, even in mild cases of diabetes, comparable to that of arsenic, I have never until recently prescribed it with this end in view, and I shall hereafter use it more frequently with this in mind. Certainly from it, too, effect can only be expected from long-continued use. A drawback to the administration of iron may, in certain cases, be its constipating effect, since constipation is always an unfavorable symptom in diabetes, the cases attended with it being bad ones. This may also, however, be obviated by small doses. Peroxid of hydrogen is a remedy which might be expected to be useful for the same purpose, but it is probably decomposed in the stomach and intestines, and does not reach the blood in a shape capable of exerting any oxidizing effect in the blood.

Massage probably operates in the same way, and also exercise. It is commonly conceded that glucose is oxidized in the muscles, and therefore muscular activity must increase such oxidation, and massage probably does the same. Over 20 years ago Dr William Richardson, of London, published a brochure on the treatment of diabetes, in the preface to which he said: "Ten years ago the author of this little book was attacked with diabetes, which presented symptoms of a very formidable character." He first treated himself by the ordinary diabetic and medical measures without any ffect, and goes on to say: "He has not only cured himself, it also many others who have faithfully and patiently car-

ried out the system he advocates." I do not think Dr Richardson's book attracted enough attention, and many who saw it have forgotten it. His method includes bathing of the body daily with warm water, using plenty of soap, and exposing the body as much as possible to the sun, a soda bath twice a week, and flannel clothing; also walking exercise, in spite of the lassitude and weakness which make this mode of treatment particularly irksome. He further says: "The bath and walking exercise are of peculiar importance to the treatment —so much so that if either is neglected but little good will result." I notice, too, that he took the tincture of perchlorid of iron and chlorate of potash, the latter also an oxidizing agent. He says that after three months he was free from sugar, and has been so ever since. As is not unreasonable under the circumstances, Dr Richardson may somewhat exaggerate the value of this treatment because it was so successful in his own case. On the other hand, it must be admitted that it rests on a thoroughly rational basis.

It is reasonable to suppose, too, that such a metabolism is under the control of the nervous system; and, while diabetes is not a disease of the nervous system, we have cited an abundance of evidence to show a very close association, to-wit, an influence of certain nervous lesions in producing the symptoms of diabetes and the occasional marked benefit from iodids in certain forms of syphilitic diabetes, together with the rarer instances in which the bromides have been found useful. Nervous diabetes may be due to the loss of nervous regulation of glucose metabolism. May not the effect of codein and other derivatives of opium, as well as the less settled effect of the petroleum products—antipyrin, antifebrin, etc.—for which the French school still claims efficiency, be due to the influence upon the metabolism of glucose in the distal capillaries of the economy?

CHAPTER III—MEDICINE

Injection Treatment of Syphilis by Means of a New Mercurial Formula

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In 1853 Alex. Wood,[1] of Edinburgh, introduced hypodermic therapy. Mercurial injections were first administered in 1856 by two Englishmen, Charles Hunter and Barclay Hill.[2] Hebra,[3] in 1864, made a vain effort to treat syphilis constitutionally by means of large injections of corrosive sublimate, and Scarenzio[4] one year later carried on more successful and prolonged investigations by means of calomel injections suspended in gummatous solutions. All the above mercurial investigations, on account of the severe painful reaction induced by their administration, were short-lived, and would doubtless have remained unnoted and obscure had not Lewin,[5] in 1868, aroused new and well-sustained interest in this now generally conceded important field of therapy.

Mercury, and mercury alone, is the sheet-anchor in the treatment of the earlier stages of syphilis. It matters not through what avenue the administration takes place, whether through the lungs, intestinal tract or skin, or in what particular form, metallic, protoiodid, biniodid, sublimate, yellow-oxid, red-oxid, calomel, salicylate, foramid, soziodol, tannate, etc., it is administrated, it is the assimilated mercury which is effective; each preparation and each form of administration has its peculiar advantages and objections, and the method which presents the happiest combination of large

dosage, easy tolerance, convenient administration, absolute control, and excellence in clinical results will readily appeal to be the most acceptable and preferable.

The inunction method is the oldest, and though eminently reliable, efficacious, and very generally employed, it has its serious objections. The rubbing of a dirty ointment over the entire body is uncleanly, courts comment and publicity, soils bed-linen and undergarments, frequently induces an artificial dermatitis, is contraindicated in hairy individuals, precludes frequent bathing, and without the aid of an attendant is applied with difficulty. Inasmuch as mercury is volatile at ordinary temperatures, and more rapidly at body temperature, this form of administration is essentially an inhalation treatment, and as such is strongly contraindicted in hemoptysis and phthisis, an objection which applies to the inhalation treatment in every form, whether it be worn in sacks (Welander),[6] or as Mercolint (Blaschko).[7] Moreover the treatment is inexact.

The internal administration is a simple, convenient and popular form of treatment. It is eminently an inaccurate method because it is impossible to determine how little or how much mercury is assimilated. This is particularly true if, as frequently happens, gastrointestinal symptoms intervene, or if old, inspissated-gelatin-coated pills, or too strongly compressed tablets, are administered. The gastrointestinal disturbance is often sufficient to distress the patient, impair digestion, induce loss of weight and to exert debilitating influences of considerable moment to this class of patients. What is probably the most serious of all objections is the fact that the assimilated mercury, for the most part, is carried directly to the liver, which, as we are beginning to believe, exerts a marked filtering, altering, and eliminating influence on toxic substances. This form of treatment also permits the patient to continue indefinitely, discontinue, or renew treatment in accordance with his own volition, and thereby removes him from the regulating attention and vigilance of the physician.

Other forms of treatment, vapor-baths, water-baths, wearing of mercurial cloth, sacks, etc., though useful as adjuvants, have not as yet received the stamp of general approval of being sufficiently active and reliable to merit special consideration in the presentation of this paper.

The method of injection which has been employed since 1856, as already stated, has at times received popular favor, and at times has fallen into disrepute, according to the conditions which on the one hand recommend it above all other methods, and on the other renders it more objectionable. If the objections, which are largely technical, can be overcome, the features which commend this form of treatment are so pronounced as to render the method justly popular and ideal. White,[20] as early as 1894, when the method was relatively in its infancy, and its technic imperfect, in a series of interrogations addressed to all the leading writers and teachers of syphiology, demonstrated that the method at that time had come into very general and popular favor, and elicited the expression of a satisfactory past and a hopeful future. To Lewin[8] belongs the credit of demonstrating that the injection treatment can be successfully employed in supplanting, with desirable effect, the other forms of constitutional treatment of syphilis, an observation that was promptly confirmed by Sigmund[9] and Zeissl.[10]

Lewin[11] demonstrated by means of a series of 14,000 cases that the duration of treatment was shortened from 10 to four weeks, that recurrences diminished from 80% to 40%, and that rapidity of action, exactness of dose, and immunity from gastrointestinal disturbances, aside from the numerous objections to other forms of treatment, strongly recommended the method of injection.

For the injection treatment, mercury in almost every form, sublimate, calomel, yellow-oxid, salicylate, soziodol, formamid, metallic, bicyanid, glycocol, asparagin, alanin, thymoloaceticum, and in almost every combination, albuminates, peptonates, benzoated, suspensions in mucilage,

oil of vaselin, olive-oil, paraffin, oil of sweet almonds, etc., has been employed. A brief survey of this unusually large field of literature, and a careful estimation of its results, will serve to demonstrate that in injection therapy also efficacy and success depend largely, if not solely, on tolerance, convenience, and dosage.

That the injection method, by meeting certain requirements, possesses decided advantages over other forms of treatment, is evidenced by the innumerable attempts at substitution; that these requirements have not as yet been satisfactorily fulfiled is evidenced by the fact that nearly all have been short-lived or their use limited to relatively few individuals, and that the other forms of administration still find a large and generous patronage.

This paper will not permit me to enter into the consideration of the nonsuccess of the many remedies which have been employed and recommended for injection use. It will suffice to say that bichlorid, which has been received into most generous favor, proved too painful to be well tolerated, causing patients to involuntarily withdraw from treatment, often induced abscess-formation and severe induration, and could be administered only in such small doses as to require almost daily visits which is ordinarily too expensive and too time-consuming for the patient. Pain, abscess formation, and induration militated against calomel and salicylate injections, and graver complications in intravenous injections. A preparation which meets the requirements more successfully, I believe, than any other is the Ol. Cinereum, or gray-oil after the formula of Lang.[12]

℞ Lanolini 3.0
Chloroform q. s. ad solutionem 10.0
Hydrargeri 6.0
Conteratur usque ad perfectissimam extinctionem hydrargeri.
Ol. Vaselin 3.0

This formula, with the following modifications, has been almost exclusively employed by me in both clinical and private practice for almost a year with most gratifying

results. I found the injection as originally prepared, according to Lang, to be somewhat irritating and difficult to preserve. The modified form is prepared by using bidistilled mercury, the same that dentists use in preparing amalgams. Six grammes of bidistilled mercury can be readily incorporated in the course of a few minutes with two grammes of lanolin, when rubbed together in a clean mortar, which dispenses with the use of chloroform, which is a decided irritant, and is not, I believe, completely eliminated in the ordinary process of preparation. This simple modification did not suffice in itself to render the preparation as unirritating as desirable. Substitutions for oil of vaselin were successively tried with oleic acid, liquid paraffin, castor-oil, cotton-seed oil, olive-oil, etc., before a preparation was found which successfully combined stability with nonirritability. This ingredient proved to be liquid albolene, which not only held the constitutents well suspended and rendered them unaffected by ordinary temperature changes, but made the preparation so fluid that it could be readily utilized for injection purposes, though the mercury was increased from 50% to even 75%.

The following has proved to be an excellent working formula, and can be readily prepared, with a proper regard for asepsis and cleanliness, by an office girl of average intelligence:

℞ Lanolini 2.0
Hydrargeri bidistill 6.0
Conteratur usque ad perfect extinctionem hydrargeri.
Liq. Albolen 2.0
S. inject one minim grain (.06) every three or four days.

This preparation can be readily drawn to a hypodermic syringe, the needle applied, and successive doses measured off by means of the retaining screw (A, Fig. 1) until the syringe is exhausted. One additional syringeful can be held in reserve, and in this manner the treatment of each indivi-al patient requires but a few moments of time. The in-tions should be preferably into the buttocks, at their most

prominent aspect, alternating from right to left with each successive injection.

It has been my rule to give an injection every fourth day, using a minim dose (which contains approximately one and one-third grains of metallic mercury), and continuing until 15 injections have been administered, that is to say, at least 20 grains of metallic mercury. In many cases I increase the dose to almost two minims, according to the indications, without untoward results. By this method relatively 10 times more mercury is administered with each injection than with the regulation 15 grains of the 1% bichlorid, formamid, or succinamid solutions, and more than twice the amount in the regular injections of calomel, salicylate, thymoloascetat, yellow-oxid, etc.

In all cases where the patient showed no marked intolerance to the remedy, and remained free from complications, the injections were made at regular four-day intervals, and in many cases, with a slightly progressive increased dose. My personal experience has impressed me that there are no special indications for a progressively decreased dose, and a gradual prolongation of the intervals between successive injections, as strongly urged by Ullmann,[13] Lang,[14] *et al.*, in order to prevent any accumulative action and a consequent unfavorable action in such resulting complications, as ptyalism, mercurial nephritis, etc. Mercurial stomatitis was carefully avoided as far as practical by exercising great care of the teeth, but when it did ensue, as it is frequently wont to occur in clinical practice, its course was apparently scarcely more severe or intractable than that resulting from other forms of treatment.

In recent infections, the injections were instituted with the appearance of the roseola, in accordance with the well-sustained views of Düring,[15] Taylor,[16] Watrazewski;[17] three courses of 15 injections are administered during the first year of infection, two the second, and one the third, and one every two or three years thereafter.

A 22 gauge steel needle, seven-eighths of an inch in

length, is employed, which insures that the injection is deposited deeply into the layer of subcutaneous fat; the injection is supplemented with a few moments of gentle massage. In the beginning the injections were made with a needle one and three-eighth inches in length, in order to insure insertion into the deep muscles; experience soon taught that these injections were unnecessarily painful and poorly tolerated. It is not my practice to remove the syringe from the needle after insertion, as recommended by Lesser,[18] in order to test hemorrhage, and in more than 2,600 injections, which have been made to date, I have yet to note the slightest symptoms of embolism in the form of syncope, cough, pain in the chest, or shortness of breath. (Watrazewski, Quincke, Ludstrom, Oedmansson, Blascko, Epstein, etc.) The clogging of needles, an objection which has been raised against the use of insoluble preparations, Bayet,[19] does not attain to this particular preparation; one needle suffices for more than 100 injections and is weakened and destroyed by erosion before it becomes plugged.

During the past 12 months, out of a total experience embracing 240 cases of syphilis (112 private, 128 clinical), the injection treatment was exclusively used wherever practical, so that more than 2,000 injections were administered. Cases that had not attained puberty, or where esthetic objections were offered, were excluded. I believe the method has been employed sufficiently long, and the number of cases and injections have been sufficiently large, to warrant the unqualified statement that the results, as regards tolerance, excellence of clinical results, absence of complications, convenience and general efficacy, have exceeded the most sanguine expectations. This opinion is also shared by those of my colleagues in whose hands I have placed the remedy, whose impartial, unprejudiced, and unbiased judgment gives it much additional weight.

Pain is seldom noted over the site of the injection. It is usually slight if present and manifests itself for the most part during the second 24 hours. Its slight and transient

character, when present, is best evidenced by the fact that patients submit willingly to the treatment, and seldom voluntarily withdraw from treatment even though they belong to the clinical ambulatory class. Induration over the site of the injection is usually very slight and often imperceptible. Exceptionally patients show an idiosyncrasy to such a degree that localized pain and duration become so severe as to indicate a change to some other form of treatment; these patients often acquire tolerance, especially with diminished dosage. A change to some other form of treatment became necessary because of pain and induration in 18 cases, or in about 10% of the cases treated. Abscess formation occurred in a single case and was induced by careless administration of the injection in the hands of a student in a clinical case; the needle entered obliquely, and the contents deposited subcutaneously.

Marked improvement was noted in all the cases; material gain in weight, rapid amelioration of symptoms, improvement in appetite, color, and activity, were evident. A few cases responded promptly to this form of treatment that had failed signally with other forms, and others that showed intolerance to internal medication or inunctions readily tolerated the injections. A case of multiple cutaneous gummata in a physician following a long-standing extragenital infection, responded promptly to six ill-tolerated injections, after inunctions, internal administrations, and potassium iodid in large doses failed to favorably influence the condition. A case of severe syphilis, associated with progressive gummatious infiltrations and destruction of tissue, yielded promptly and completely to one course of injections after other methods, and large doses of potassium iodid failed to be of any benefit. Clinical examples of this character could be multiplied almost indefinately, but it will suffice to state that in point of efficacy, the treatment embraces all that is desirable, and that patients experience marked improvement, not only during the treatment, but a state of well-being that persists for many months

after the treatment is suspended. In the vast majority of cases the patients show the greatest tolerance; in a few, owing to inexplicable idiosyncrasy, the distress is severe enough to render the treatment uncomfortable or a change to some other form highly desirable if not imperative. Taken all in all, its greater tolerance, and the absence of complications, this formula should be given the preference over other forms of injections, and with the improvement in these directions the other natural advantages which accrue to the injection treatment over the internal and inunction methods should give it the high and important place in syphilitic therapy which personal experience during the past 12 months leads me to firmly believe it justly and deservedly holds. It has not yet reached, however, that high state of perfection which bids it to entirely supplant all other forms; both the internal and inunction methods will still play very important roles, not only as separate forms, but also when combined with each other, or with injections in accordance with the special indications. Every modification which renders the injections more tolerable, and at the same time removes the likelihood of complications, is a step nearer the goal, and inasmuch as the obstacles leading thereto are almost purely technical, it seems not at all unlikely that this goal can and will be reached as soon as mercurial injections attain the same relative tolerance that iodin injections have recently attained in "iodopin."

To recapitulate, the success of syphilitic therapy depends on the amount of mercury assimilated by the body, no matter in what form or through what avenue it is administered. Inunctions are objectionable, because they are uncleanly, court comment and publicity, entail inexact dosage, and predisposes to dermatitis. The internal treatment is inaccurate, predisposes gastrointestinal disturbances, emaciation, anemia, and the assimilated mercury is subjected to the altering, filtering and eliminating action of the liver. The injection method dispenses with all the above objections, and combine with rapidity of action relative by greater

efficacy, shorter treatment, diminished recurrences. Its strongest objections in all its various forms have been intolerance (local, pain and induration), grave complications, and small and too oft-repeated dosage, unstability, and difficult preparation and administration of the remedy. These objections have been greatly relieved if not removed by the above modified formula of oleum cinereum.

Additional experience which has been gleaned from observation and study during the past six or eight months, subsequent to the preparation and presentation of this paper, has served to demonstrate that the preparation, according to the above formula as heretofore employed, can be rendered decidedly more stable and tolerable according to the following modification. I have noted that during the extreme hot weather the preparation would not remain stable for any great length of time, and that the more liquid albolene would separate and flow freely to the surface, while the heavy mercury would gradually collect and gravitate to the bottom of the retainer; that commensurate with these changes, the preparation became progressively more irritating, so that its administration was attended by such a degree of reaction in the form of induration, tenderness and pain that it could be employed in most cases only in diminished dosage. I was engaged at this time in experimenting with prosthetic paraffin injections, and the degree of pain and reaction, which attended their employment, led me to believe that a considerable amount of the reaction from the mercurial injections was occasioned by the free uncombined liquid albolene. This observation was readily confirmed by a few liquid albolene injections, which were promptly followed by relatively the same painful reaction. I therefore changed the formula to a mixture of equal parts of lanolin and metallic mercury, with just sufficient liquid albolene to render the preparation thin enough (varying in amount with temperature conditions, less in summer, more in winter) to allow it to be freely drawn into the barrel of a hypodermic syringe and to be freely expressed through a 22 gauge needle. This formula

made an excellent working preparation, and though the repeated variations rendered the dosage inaccurate in point of tolerance and stability, it was a marked improvement over the original formula.

There was another feature of the treatment which hung over me like the sword of Damocles, and that was the danger of embolism. Notwithstanding the fact that I had administered between 2,000 and 3,000 injections and have never noted the slightest symptom of such a complication, I was aware that many reliable cases had been properly observed and carefully reported to impress me that this character of danger was always present. The full realization of the danger came over me when one of my patients, who had just received twelve injections, suddenly developed a facial paralysis. Coincidently another patient who had received injections at the hands of one of my colleagues, Dr Gilbert Bailey, developed a paraplegia of the lower extremities. Fortunately, neither of these conditions were attributable to the injections, for the facial paralysis was a Bell's as confirmed not only by subsequent course, but also by careful examination by Dr D. I. Wolfstein. The paraplegia, of course, could not have been of an embolic nature. These instances, however, induced me to endeavor to minimize the danger. The first impulse was to remove the albolene which, by reason of its liquid nature and mineral character, not only strongly predisposed embolism, but once lodged as a foreign body could not be assimilated and removed. For this reason injections were attempted with the following formula:

℞ Hydrarg. metal bidistil.
Lanolin, (Liebreich.) aa 25.0
Conteratur usque ad perfect extinctionem hydrargeri.
Sig. Inject 1 to 3 minims every 3 or 4 days.

It was found necessary to heat the preparation to about 100° F (38° C) in an oven, or over an ordinary radiator, to render it sufficiently fluid to allow it to be readily drawn into the barrel of an hypodermic syringe, and to be maintained at that temperature, if an ordinary syringe (Fig. 1) is used

for injection purposes. If however an extra strong syringe (an ordinary obtunding dental syringe will readily answer), armed with a 20 gauge needle is employed, the contents can be readily expressed at ordinary temperature and in such semisolid form that danger from embolism is minimized to an extreme degree. I have employed this formula exclusively during the past three or four months with the greatest degree of satisfaction and success. One to three minims can be readily measured by means of the retaining screw (Fig. 1, A) and injected with the greatest degree of tolerance to the patient. Each grain of lanolin by volume (which forms the bulk of the preparation) contains a grain of metallic mercury, so that the dosage is correspondingly heavy. Control is perfect, induration and painful reaction are practically *nil*. The preparation is exceedingly and almost indefinitely stable at all ordinary temperatures, and can be prepared with the greatest ease. The simplicity and ease of its preparation and administration, the extreme tolerance as evidenced by the absence of pain, induration and other forms of complication, its uniform and indefinite stability under all ordinary conditions, the control exercised over the patient, greater cleanliness and privacy, larger and more accurate dosage, the lack of insult and distress to other organs and the unfailing character and promptness of the results is sufficient proof, I believe, to stamp this method of mercurial treatment of syphilis the most successful and practical of all methods.

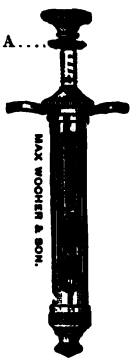

Fig. 1.

Dentists exercise great care in the selection of a pure bidistilled mercury for the preparations of their amalgams. The commercial metallic mercury obtainable from common sources will not form a satisfactory amalgam.

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DISCUSSION

Dr J. H. McCassy, Dayton: While I am an eye, ear, nose and throat man, one might think that I, with my fellow specialists, did not come into contact with many syphilitic cases, yet the contrary is the case. When you consider that about 75% of the cases of iritis are due to syphilis, and that the manifestations of syphilis in the nose and throat are exceedingly common you can see how we specialists come to see and do with a great many cases of syphilis.

I wish to add my testimony to the fact that I have known of a number of cases of syphilis which led on to certain conditions because the injection method of treatment was not employed. We have been taught to inject as near as possible to the seat of the disease, and that is something which I wish to bring out. While we are called upon to treat syphilitic manifestations about the eye, nose and throat, those of you who have not used injections about the throat very much would be surprised to see how simple it is to make such injections. As a rule mercurial injections under the skin give rise to great pain, but even so I think we would do well to try the injection method in these cases as far as we can, of course feeling our way with the patient, yielding to his inclination as much as you can, and as the case progresses you will be able to have your way and thereby cure your patient. If you do not use the injection treatment on your cases you will find that quite a number of your patients will drift away from you and go to the physician that will use the up-to-date treatment—the injection method.

Dr M. L. Heidingsfeld, closing: In closing I have only to add that in presenting this paper I have endeavored to detail my personal experience with a preparation which has served me by far the best in the method of syphilitic treatment, and which appeals to me to be the most rational, scientific and effective. The features which impress me the strongest are the simplicity and ease of preparation, relative large dosage, marked tolerance, and stability of the preparation. The ease with which it is tolerated has been kindly pointed out in Dr McCassey's remarks by the fact that clinical patients have shown no disposition to withdraw from treatment, but persist until the full course has been administered, an occurrence that is unusual, no matter what form of treatment is administered.

I trust that the preparation will receive a thorough trial at the hands of the profession, and hope that its use, with the proper regard for the above mentioned instructions, will be attended with the same gratifying results.

I only wish to say further that it is desirable to begin the treatment with the minimum dose, ¼ to ½ grain, and to increase slowly within the bounds of tolerance. Do not attribute every bad result to the method until you are satisfied your technic is perfect. A case of this character recently came to my notice where the injection was made in the calf of the leg.

Diphtheria
Its Symptomatology and Clinical Diagnosis

By F. D. Case, M. D., Ashtabula

There are two forms of pseudomembranous sore throat of bacterial origin—diphtheria caused by the presence and development of the Klebs-Loefler bacillus, and pseudo-diphtheria caused by streptococci and other pus-forming cocci. Diphtheria is an acute infectious disease primarily local, characterized by a fibrinous exudate upon the surface attacked, and by constitutional symptoms of varying intensity. The constitutional symptoms are due to a soluble poison, elaborated at the seat of the lesion by the bacillus, and

absorbed from thence into the general system. Diphtheria always results either directly or indirectly from a previous case, the presence of the bacillus in quantity and activity sufficient to overcome the individual's power of resistance constituting the condition necessary for the production of the disease.

Diphtheria differs much in general character in individual cases. Sometimes both the general and local symptoms are trifling, attended with little fever, slight soreness of the throat, little disturbance of the nervous system, and perhaps a trace of albumin in the urine.

Sometimes again the disease is terribly severe from the first; the mucous membrane of the throat may be dark red or livid, the dysphagia extreme, the fever high, but of low adynamic type, with great muscular weakness, the urine loaded with albumin and casts. The period of incubation is generally shorter than that of other infectious diseases, being usually two or three days, but may be prolonged to eight or ten days.

A typical case of diphtheria is ushered in with a chill or chilly sensation, attended with malaise, fever, and "during the same day—sore throat." (Northrup.) It is characteristic of diphtheria to show objective signs in the throat early in the disease, but the nares, larynx, and occasionally other localities may be the primary seat of the lesion. Along with complaints of dryness, burning and dysphagia, there may be at first merely a hyperemia of the tonsils, palatine arches, or pharynx, then white or grayish-white patches from deposit of lymph are seen. Sometimes two or three centers of deposit are seen from the very first; these are filmy and easily detachable. The submaxillary and adjacent lymphatics become swollen and tender. A viscid mucus forms in the throat, which keeps the patient hawking, spitting, or swallowing. The pulse is increased in frequency in proportion to the severity of the disease. In malignant attacks it is weak with cold extremities, and the usual indication of a feeble capillary circulation.

The temperature in diphtheria is not characteristic, and is not usually especially high; in moderately severe cases it may reach 102° or 103°, and in severe cases 104°.

As the disease progresses the pseudomembrane becomes thicker and darker in color, and infiltrates the mucous membrane to such an extent that, if forcibly removed, the surface beneath is seen to be raw and bleeding, and in a few hours becomes covered with a fresh layer of membrane. The pseudomembrane may remain localized or may spread over the whole interior of the throat or extend thence to the nose, larynx, or bronchi.

Toward the end of the first week or a little later the pseudomembrane separates by a process of sloughing, leaving a raw surface behind it; the throat is less swollen, the pulse and general strength improved, and the symptoms (barring sequels) indicate an early convalescence.

Albuminuria is present in upward of one-half the cases of diphtheria. The amount varies greatly from a mere trace to so large a quantity that the urine becomes semisolid upon the application of heat. It appears most frequently on the third or fourth day of the disease; its duration is frequently not more than one to three days, and seldom continues more than 10 days.

Nasal diphtheria, whether primary or secondary to a deposit in the throat, is characterized by more or less complete obstruction of the nasal passages, accompanied by an acrid mucopurulent and sometimes bloody discharge, which excoriates the nares and lip. The inflammation of the lymphglands and ducts, in which the nasopharyngeal mucosa is very rich, favors systemic infection, and usually results in a marked aggravation of the constitutional symptoms.

Laryngeal diphtheria presents a very different clinical picture from the conditions just described. Owing to the limited absorptive power of the laryngeal mucous membrane the toxemia is not materially increased, by extension of diphtheritic inflammation to the larynx. The obstruction to respiration from laryngeal stenosis, with gradually deepening

cyanosis and threatened asphyxia, indicate the most serious complications of the disease. The first symptoms of laryngeal involvement are huskiness of the voice, a brazen cough, and noisy stridulous inspiration. Gradually the cough becomes more and more hoarse, the voice fails steadily until aphonia is complete, the stridor at first only affecting inspiration, becomes louder and is heard with expiration, and every effort to fill the chest becomes more and more labored; with each inspiration there is depression of the suprasternal and supraclavicular spaces, and the epigastrium. The face is pale, the lips livid, the finger-tips blue, and, as the patient struggles to overcome the increasing obstruction to respiration, the body is bathed in perspiration. As the difficulty in breathing further increases the patient instinctively sits up, and with elbows supported and widely separated rests the head upon the open palms, in order to give free play to the muscles of respiration. In such a case, unless quickly relieved by treatment or operative interference, the cyanosis deepens, the respiration becomes more and more labored, drowsiness supervenes, and the patient sinks into a stupor which is relieved only by death.

The characteristic and diagnostic feature of diphtheria of the larynx is the progressive dyspnea with aphonia. If aphonia is absent the obstruction to respiration is not laryngeal.

The clinical picture which I have endeavored to exhibit to you is that of pure diphtheria, but unfortunately such cases are seldom seen. There is in most cases another factor that adds greatly to the gravity of the disease; an added infection due to the various organisms causing pseudodiphtheria, that find in the local inflammatory lesions suitable conditions for growth.

Under favorable conditions the streptococci may penetrate the tissues beneath the pseudomembrane, enter the lymphatics, and gain wide access to the body, to the serous cavities as well as to the mucous membrane. We may find ourselves face to face with suppurative inflammations in various parts

of the body, "empyema, arthritis, endocarditis, pericarditis, and bronchopneumonia." As the result of mixed infection the pseudomembranes become darker and more friable, and may be detached in places to interfere with acts of respiration or excite violent paroxysms of cough. "The peculiar and fetid odor of decomposition is now present, the face is pallid, the pulse feeble, and blood-poisoning is marked by apathy and profound adynamia."

The lymphatics and the submucous and interglandular tissues are invaded by the septic process, "so that indurated glands tender to pressure may stand out prominently above the general surface of the neck, or the natural outline of the neck be obliterated in a universal tumefaction." Parenchymatous changes may occur in the heart and kidneys, "so that heart failure in the course of the disease; endo and pericarditis with subsequent valve-lesions; albuminuria with subsequent Bright's disease, may attend the course, complicate the progress, or protract the convalescence, if they do not directly take life." (Whitaker.) One of my own cases, a boy of twelve, who had diphtheria with albuminuria and grave cardiac conditions, was found four years later to have a typical case of cyclic albuminuria. The most striking and characteristic sequel of diphtheria is paralysis. Indeed it has been proposed to define diphtheria as an acute infectious disease produced by the action of the Klebs-Loefler bacillus, and characterized by the development of nerve degenerations. Paralysis occurs in about 25% of non-fatal cases. It is rare in infancy. Liability to it increases with years. "It occurs alike in the strong and feeble; the mild as well as severe cases." It is customary to speak of it as a neuritis, but ordinary forms of neuritis are attended with pain, while the condition under consideration develops and continues without pain. As remarked by Whitaker, we are better informed as "to its results than its lesions."

While it may be intercurrent with the disease, it does not as a rule appear until the second or third week after convalescence has begun, and may be deferred that many months.

The first indication is loss of "patellar reflex," a phenomenon of great diagnostic significance, as well as an indication of the probable development of paralysis elsewhere. After loss of knee-jerk it usually first shows itself in the palate, in difficulty of phonation and deglutition. Fluids regurgitate through the nose, and particles of solid food may pass in the same direction, to the great discomfort of the patient.

The paralysis may also involve the epiglottis which ceases to protect the larynx during deglutition, and more rarely to the muscles of the pharynx increasing the dysphagia. Next in order of frequency is paralysis of the intrinsic muscles of the eye, causing indistinctness of vision, and frequently resulting in inability to read. Occasionally strabismus, more rarely ptosis, from paralysis of the extrinsic muscles of the eye is seen. In about one-half the cases the paralysis goes still further, involving the extremities; first and more particularly the lower. In some cases there is formication, tingling, or numbness, but more frequently motion alone is impaired. The legs are weak; there is an uncertain staggering gait with frequent falls. The paralysis may be so extensive as to render the patient entirely helpless. Hemiplegia occasionally results. In a single case coming under my own observation the hemiplegia was accompanied by aphasia. After seven years, motion of the upper extremity remains much impaired. Paralysis of the diaphragm, intercostal muscles, and heart is fortunately much more rare. If the diaphragm is paralyzed, respiration is entirely thoracic; if the intercostals, then the diaphragm must do the work. Either affection is characterized by attacks of urgent dyspnea and even cyanosis. By far the most important local paralysis is met with in connection with the heart. It follows tonsilar and nasopharyngeal forms of the disease frequently, but is rare after other forms.

Whether occuring early or late in the disease, the symptoms of involvement of the heart are in general the same. There may be bradycardia or tachycardia, or they may alternate in the same patient. Nausea and vomiting may precede

the cardiac effect. The face and extremities are cold, the pulse feeble, the temperature sinks and may become subnormal, and death may take place in a few hours from syncope. But not all cases of heart failure present the foregoing symptoms. In some cases the patient is seemingly entirely convalescent, and may be up and about, when perhaps following a sudden exertion or excitement, unforeseen paralysis of the heart results in instant death.

It is of the utmost importance that the diagnosis in a case of diphtheria be made early, that proper remedial measures may be employed at the beginning, as well as measures to prevent the spread of the disease. In a large proportion of cases the diagnosis is easy after 24 hours, since in addition to the fever and pain in swallowing the characteristic gray patches have begun to form on one or both tonsils, and there is fullness and tenderness at the angle of the jaw. The diphtheritic exudate, deeply set and surrounded by inflamed and swollen mucous membrane, has been not inaptly compared to the crystal of a watch surrounded by its rim. The diseases most frequently requiring differentiation from diphtheria are follicular tonsilitis and pseudodiphtheria.

Follicular tonsilitis is a very common disease, frequently spreading through families as if contagious. Like diphtheria it begins suddenly with headache, fever often reaching 103° or more, pain in the back and limbs, and chilliness. There is dysphagia and the surface of the tonsils is hyperemic.

In a few hours a white cheesy material exudes from the crypts of the tonsils, forming rounded masses of varying size from that of a mustard-seed to that of a small pea. The secretion occurring as small rounded masses, distinct from one another, is distinguished by its appearance from the false membrane of diphtheria, which is at first a thin pellucid film, subsequently becoming thicker. The secretion of follicular tonsilitis, consisting simply of epithelial cells held together by the secretion of the crypts, is usually limited to the tonsils, is friable and easily detached by a swab or brush, and usually disappears in two or three days. If two or more of these

masses chance to coalesce, they may resemble the membrane of diphtheria to the eye, but they still present the same physical character, and are readily detached without bleeding.

Pseudodiphtheria occurs most frequently in low or debilitating states of the system, or as a complication of scarlatina or measles. The membrane resembles that of diphtheria in appearance, but is soft and friable, coming away in fragments when touched by a brush or swab, without causing bleeding, or any injury to the mucous membrane. It seldom appears upon other parts than the tonsils or lateral pharyngeal wall, whereas the diphtheric membrane often appears upon the uvula, posterior pharynx, and may extend to the nares or larynx, in addition to the tonsilar surfaces. The differential diagnosis between diphtheria, and pseudodiphtheria may be summed up as follows: diphtheria follows exposure to infection either direct or indirect from a previous case, is most frequent in early life, from the second to the seventh year; the membrane rapidly spreads from the tonsils to pharynx, fauces or uvula, is firmly attached to underlying tissues, and if forcibly removed leaves a bleeding surface upon which the membrane is rapidly reproduced. Albuminuria is common, constitutional depression marked, the pulse feeble, and there is great prostration. Diphtheria usually lasts from five to eight days before marked improvement is seen, paralysis more or less extensive frequently occurs as a complication or sequel.

Pseudodiphtheria on the other hand occurs independently of other cases. It may occur at any age. The membrane is usually limited to the tonsil, is loosely attached, and may be easily removed without bleeding; reproduction of the membrane is not rapid or extensive. Albuminuria, except when complicated with scarlatina or measles, is rare, constitutional depression is not marked, and, except when complicating infectious diseases, it rarely lasts more than three or four days. It is not followed by paralysis. While in a great majority of cases, the clinical history and symptomatology will make a differential diagnosis possible, yet in doubtful

cases only a bacteriologic examination will enable us to make the distinction with certainty.

Patients seldom die from the diphtheritic toxemia alone. In most fatal cases one or the other of the complications or sequels is the direct cause of death. "The gravity of the disease is rather a question of absorption than deposit, and the danger is determined by the penetrability of the barrier which the tissues interpose. This is a condition which may not be discovered by simple inspection. It reveals itself only in its effects." (Whitaker.)

References: Pediatrics, Rotch; Diagnosis of Internal Medicine, Butler; Sajous' Annual and Analytical Cyclopedia of Practical Medicine; System of Medicine, Pepper; Practical Medicine, Loomis; Practice of Medicine, Osler; Theory and Practice of Medicine, Whitaker; Practice of Medicine, Flint.

The Medical Treatment of Diphtheria

By JEFFERSON C. CROSSLAND, A. M., M. D., Zanesville

LOCAL TREATMENT

In the application of local remedies in the treatment of diphtheria, the purpose is to destroy at once the pseudo-membrane, to dissolve it, to get an astringent action on the tissues, or to cleanse and disinfect.

The method of application may be by gargling, spraying, insufflating, injecting, chemically cauterizing, swabbing, irrigating and inhaling. There are two objects aimed at in the local treatment, *viz.*, to limit the spread of the disease by maintaining a healthy condition of the mucous membrane and to restore the affected area to a normal condition.

Gargles are of very limited value so far as affecting the disease is concerned. They wash a very small portion of the diseased area, but are serviceable in maintaining a healthy condition of the unaffected membrane with which they may come in contact.

This method of application is not practicable in young children, but the remedy so used may be more effectively employed and can be used in all cases with the spray, or

spray and brush. This method of local treatment is indispensable in many patients and types and locations of the disease. The atomizer should throw a very coarse and heavy spray.

Application by insufflation has been wisely discarded except in the hands of laity who persist in that method of applying sulphur. The same may be said of direct injection into the diseased areas by specially designed instruments.

To attempt the direct destruction or disinfection of the pseudomembranes by strong solutions of carbolic acid, silver salts, mercury and Loeffler's solution, etc., is harmful except in ulcerated conditions, and should not be practiced. The pain resulting therefrom, the resistance encountered, inability to limit the application to the diseased area, wounding of normal membranes and resultant infection and the swallowing or absorption of excessive quantities and their evil constitutional effect are a strong argument against their use. We can secure a direct and sufficiently concentrated application of sufficient medicine with the swab to the diseased areas. This method of application can be practiced in any location of the disease except the larynx and trachea.

TECHNIC OF SWABBING

What I choose to call the technic of swabbing these diphtheritic cases seems to me no less imperative than is our surgical technic. It is imperative for the patient's recovery and the physician's protection. For a physician to seat himself in front of a diphtheritic patient to swab without some sort of protection against the secretion which his clothing and person will most certainly receive, is to offer himself a willing victim to the disease or constitute himself a common carrier of the disease for the special benefit of his other patients and his own family. To don some sort of a gown or face cover, or have an attendant hold a pane of glass before his face is sufficient cause to produce spasm in a nervous child and make older ones think he is about to make war on them without having the courage to come out in the open.

Teach the child, if old enough, to depress the tongue and expose the throat by gagging, or by breathing deeply through the mouth. Assure the patient that he cannot be hurt or injured by a wad of soft cotton. If the treatment is to be applied with the child on the bed, place the child on the side of the bed and spread some newspapers or rubber cloth over the floor or bedding and place a vessel containing water near by. Wad up some absorbent cotton, grasp it with a Husson's spongeholder or a Skeen's curved tenaculum and saturate the cotton with the medicine to be used. The nurse can gently hold the hands, if it is thought that the child may not be able to control itself sufficiently long for a proper swabbing. Steady the child's head with one hand, direct it to expose the throat, as above indicated, and apply the swab to the seat of the false membrane. This is done while standing back of or to one side of the patient, consequently no part of you or your clothing is exposed except the hand. This can almost invariably be done without the use of a mouth-gag or a tongue-depresser, even in very young children. The swab can be rotated or so manipulated as to thoroughly medicate and detach if possible the exudate. This may be repeated as often as seems necessary. Twice is usually sufficient for one treatment.

Each time the swab is used not only is disinfection accomplished, but more or less of the membrane is carried away on the swab, and if any is left loose in the throat, the gagging and effort made in obedience to command, together with the aid of gravity secured by lowering the child's head will result in its expulsion. This is a much better disposition of it than to allow it to be swallowed, as is usually the case in young children when the membrane is detached by natural process. Having proved to these patients that the process is painless, if not entirely pleasant, few will hesitate and fewer resist thereafter. The nasopharynx can easily be disinfected in the same way by the use of a postnasal cotton-holding forceps and a palate retractor.

Efficient local treatment of the disease, when located in

the posterior nares and the nasopharynx, is especially imperative as systematic infection from these regions is highly probable. Slender nasal forceps or a cotton-wrapped probe can be used in the nostrils unless too much obstructed by dense membranes. By periodicallv dislodging the detachable false membrane and disinfecting the surface, the liability of infecting the attendant and contaminating the bedding is minimized. When the exudate in the nose is light or absent with an acrid discharge, the spray will fulfil all the requirements. The atomizer should throw a heavy spray.

The frequency of cleaning and disinfecting will depend upon the character of each case, the interval varying from one to three hours. Where the nostrils are obstructed, or nearly so, a passage should be forced for the purpose of medication, and to facilitate respiration. A heavy spray will meet the requirements in ordinary cases; in others the probe and syringe or irrigator will be required.

The cleaning and disinfection of the seat of the disease not only minimizes the danger *in situ*, but restricts the danger of infecting the deeper respiratory tract and cavities accessory to the nose and throat, as well as the digestive tract by the diphtheritic germs and toxins and by the commonly associated bacteria, namely, streptococci,, staphylococci and pneumococci.

The treatment of these nasal and throat cases as well, may be practiced with the patient in the recumbent or semi-recumbent posture on the bed or on the nurse's lap. [The solution used should be warm.] The administrations of solutions of iron and other remedies for their constitutional effect have no inconsiderable good local effects.

In laryngeal cases and tracheobronchial diphtheria it is important to hasten maceration of the false membrane. It is in these regions, inaccessible as they are to topical treatment by other methods, that steam alone or mixed with medicinal vapors by reason of the histologic structure of the mucous membrane is especially effective in softening the false mem-

brane by increasing and liquefying the secretions. Steam generated in a tea-kettle by boiling water over a grate when the temperature will permit and carried out into the room or to a tent on the bed, if desired, by a piece of hose or tin conductor is practicable and most effective. Oil of eucalyptus, carbolic acid and turpentine may be added with benefit. Increased secretions from the membranes is also secured by partaking freely of water, liquid foods and spirits. This outward flow of fluids not only macerates and floats the false membrane but retards the absorption of toxins. The slaking of lime in the room by which application of steam and lime is secured is as effective as it is old. The methods of application have been dwelt upon. What is the best remedy for local use? Peroxid of hydrogen. Why? To accomplish the greatest good a local remedy must combine the greatest efficiency and ease of application. This is just what peroxid of hydrogen does. It is necessary to be able to apply the local remedy without resistance from the patient. In the asthenic stage the child cannot withstand the evil effects of fright and struggling. It is necessary in the early stage to have the patient's cooperation in order that the development of dangerous conditions may be avoided by thorough treatment. With a medicine practically without odor, taste and color and leaving the patient more comfortable after its use, its administration is always easy. It may, and usually should be used in full strength, consisting of a 10 to 15 volume solution. It can be used by spray, gargle or swab, and if swallowed accidentally or intentionally, good, and not harm will result.

GENERAL TREATMENT

The diet should be chiefly liquid and soft food, but it should be highly nutritive. Milk, eggs and broths are important articles. The patient should be encouraged to drink water freely. One or two grains of calomel in broken doses in the very early stage renders good service by relieving

nausea and stimulating and invigorating the digestive organs and creating appetite. The tincture of the chlorid of iron administered with glycerin, or in the form of many of the excellent pharmaceutic preparations, is a time-honored remedy, capable of great good by its local as well as by its general effect, and it is seldom contraindicated. When constitutional symptoms are severe, stimulants should be given freely. Weak and irregular heart-beats call for cardiac and general stimulants, such as strophanthus and strychnin and absolute rest. Paralysis requires rest, strychnin, massage, electricity and the best nutrition. The management of complications and sequelæ in general is hardly in place in this paper.

ANTITOXIN TREATMENT

In a recent issue of the *British Medical Journal* an English surgeon of note in a communication entitled "Notes on a Visit to Some American Hospitals," states that in a Philadelphia hospital he was told that anyone who would withhold serum in diphtheria might expect an early summons before a magistrate. This indicates the consensus of opinion in favor of antitoxin in this country. Nevertheless the fact remains that there is much skepticism. This skepticism is found where inexperience and prejudice abound. In a report of a recent meeting of a medical society, not of the orthodox faith, I am pleased to say, I read that after a thorough discussion of antitoxin, the society arrived at the conclusion that it was still in the experimental stage and further development would be awaited, before pinning their faith to the new remedy. The developments were occurring with great frequency in the community at the time, in the form of deaths from diphtheria treated without antitoxin. Those who have read or heard of any of the literature on the subject, or have observed the results of physicians who use it intelligently and still hesitate to use it, must still entertain a lingering doubt of the value of quinin in malaria and wonder if Jenner's discovery after all is not a myth.

Dosage: The quantity to be administered is a matter which has to be determined in each case. We cannot tell how much toxin is generated in any case. Our only guide is to administer the antitoxin until the good local and constitutional effects are evident. The local effects consist of the limitation and shrivelling of the membrane, diminution of discharges, improvement in the odor, subsidence of the swelling in the throat and involved lymph-bodies. The characteristic general effects are a decline in temperature, slowing and improvement in the pulse, subsidence of gastric disturbance, restoration of the nervous equilibrium, and a general sense of relief. In a series of 61 consecutive cases with as many complete recoveries occurring in the past nine months, during which period the disease was epidemic for several months, I administered the serum in doses varying from 1,000 to 20,000 units. All of these cases received antitoxin except three. My observation has been that persons suffering from tuberculosis of the throat require very large quantities. One who has had considerable experience only needs to recall a few cases in which in the early stage he suspected a mild infection and withheld serum and later in the cases found his patients in a gallop to the grave and then witness the unmistakable good effects of the serum to convince him that in antitoxin there is life. It is scarcely necessary in this audience to add that reliable statistics show that in all classes of the disease treated with antitoxin, the mortality has dropped from about 30% to 10 or 12%. In laryngeal cases the mortality and recovery percents have been reversed by antitoxin and intubation. Referring to our English cousin again, I recall an article in the *British Medical Journal* in which it was claimed that a large number of cases in which carbolic acid had been injected to determine whether or not after all it was not the carbolic acid which possessed the curative power the results were equal to the antitoxin treatment. However that may be, it is certain that the antitoxin results are good if the practice is extravagant. While the injection may be made in any region where there is an abundance of loose areolar tissue, by

far the preferable regions (from every view point) are the lateral abdominal walls. The asepsis practiced in its administration has much to do with the development of skin complications.

Untoward Effects: Of these the most common are urticaria and erythemias. They have no more serious effects than to occasionally retard convalescence. In a report of a series of over 500 cases reported in the *British Medical Journal* resultant skin eruptions appeared in 115. In my own cases I observed urticaria once and a local erythemia once. This includes in addition to the 61 cases of diphtheria something over 30 cases in which it was used for immunizing purposes. It is worthy of note that diphtheria did not develop in a single one of these immunized cases. The immunized patients varied in age from 8 weeks to 40 years. The immunizing doses from 500 to 2,000 units. In the management of laryngeal cases emesis produced by ipecac or zinc sulphate will very frequently dislodge the membrane and relieve embarrassed breathing. Especially is this true when serum therapy is practiced. The emesis may have to be repeated one or more times and can safely be done in sthenic cases. Where this fails or cannot be judiciously practiced intubation as per the paper on operative treatment is required.

A FEW SUGGESTIVE REMARKS IN CONCLUSION

The disease is primarily local, hence the value of efficient local treatment.

Antitoxin should be the initial and not the last remedy.

Antitoxin is specific in its action on the diphtheritic toxins.

Antitoxin if relied on to the exclusion of other remedies will frequently disappoint.

It will not meet all the requirements in mixed infections.

A good rule is to immunize all children under three years of age in a family in which the disease is present.

Don't believe that very young infants will not contract

the disease. In our epidemic, a few at least, one, only a few days old, died of the disease.

Don't delay from night till morning or morning till night making a call to a case of suspected diphtheria.

Always assume that every case may be severe, unless vigorously and thoroughly treated.

The Surgical Treatment of Laryngeal Diphtheria

By C. L. Patterson, M. D., Dayton

Since the discovery and general use of antitoxin, operative interference is not required as often as formerly in cases of laryngeal diphtheria, or membranous croup. Dyspnea is not so marked a symptom, nor does it continue so long as was the case before the use of antitoxin, but an operation is required in a certain percentage of cases, and is one of the most important operations with which the surgeon has to do. No other operation in all surgery is so urgent when required; no other operation is followed by such marked and gratifying immediate results. No sight more distressing is ever witnessed by the physician than the struggle of a child for the breath of life. The look of pain and suffering on the face of a child that is exerting all of its fast-failing strength and directing all of its efforts and attention to the securing of a sufficient quantity of air to keep alive the spark of life, is one that, once seen, will never be forgotten.

The prominent symptom calling for surgical treatment in this disease is obstructive dyspnea, characterized by suppression of the voice, great difficulty in inspiration, retraction of the abdomen, great restlessness, lividity of the lips and inability to breathe in the recumbent posture. All these symptoms, together with a high temperature, call imperatively for operative interference.

When such a condition prevails the operator has a choice of two methods of procedure—first intubation, and second tracheotomy. The first, which consists in introducing a tube

into the trachea, was suggested by Hippocrates, and though revived at different times, was not put to practical use until perfected by Dr Joseph O'Dwyer, of New York, since which time it has displaced, to a very large extent, the old operation of tracheotomy. An intubation set for children consists of six tubes of different sizes, an introducer, an extractor, a mouth-gag and a scale of years. Each tube is provided with an obturator by which it is to be attached to the introducer. The tube indicated by the scale of years is selected, a strong thread is passed through the eyelet in the head of the tube and the ends tied together. This thread is held firmly during the operation of introducing the tube to prevent the tube going into the stomach in case it should slip into the esophagus instead of into the larynx. The child, snugly wrapped in a sheet or blanket, is placed in a sitting position on the lap of an assistant with his head resting against the assistant's left shoulder, and his legs are held firmly between the knees of the assistant. A second assistant stands behind the patient and holds his head firmly between his hands and also steadies the mouth-gag after it is placed in position. The surgeon sits on a chair directly in front of the patient and introduces the mouth-gag in the left side of the patient's mouth. The handles are then compressed and the mouth opened as widely as possible. The surgeon then passes the index-finger of the left hand into the larynx, feels for and hooks up the epiglottis. The tube which is attached to the introducer is held firmly in the right hand, and is passed into the mouth, the joint of the tube being held close to the tongue in the middle line until it reaches the finger that is holding up the epiglottis. It is then passed downward, and by the aid of the finger is guided into the larynx. The right hand is then raised, and the tube is shoved down into the larynx and is held in position while the obturator is removed. This must be done quickly as the air is entirely shut off until the obturator is removed. As soon as the obturator is removed there is a sudden inrush of air which brings on a violent fit of coughing, during which the tube may be

coughed out, together with a mass of mucopurulent matter and membrane. In performing intubation the tube is sometimes slipped too far back and passes into the esophagus. Another accident that may occur is the shoving down into the trachea a mass of membrane too large to be coughed through the tube. In such event the tube should be at once removed by means of the thread, and if the breathing is not then relieved tracheotomy should be rapidly performed. Though intubation has displaced almost entirely the operation of tracheotomy in the treatment of laryngeal diphtheria, I believe there are certain cases in which this operation is of more value, and, indeed, cases in which it must be resorted to as intubation does not relieve the dyspnea. Where the tonsils are very large, where there are growths or abscesses in the pharynx, or where the membrane extends too far down the larynx for the tube to penetrate it, I believe tracheotomy to be indicated rather than intubation. Should an anesthetic be used in this operation? As a rule I should say no. In the first place, it is adding another element of danger to the operation, and in the second place it is not often required, as the pain is not great, and the work need not occupy a great deal of time. The danger of shock to the system, already weakened by disease and perhaps by carbonic acid poisoning, the result of imperfect respiration, is great and should be eliminated if possible. The more urgent the need of an operation the less will an anesthetic be required, for a child fighting for air, cyanosed, perhaps semiunconscious, will not as a rule, struggle against the efforts of the surgeon, but will rather welcome any interference that promises relief from the distressing symptoms.

In performing tracheotomy the surgeon has the choice of the low or high operation, that is, above or below the isthmus of the thyroid gland. The high operation is usually preferred, as at this point the trachea is more superficial, and the operation can be performed in less time, which is so often an element of importance. In performing this operation the patient is placed upon his back near the right side of the table.

Some firm support, such as a sand-bag or roll of blanket, is placed under the neck and shoulders, and the head is bent back in extreme extension. An assistant steadies the head, keeping the chin exactly in the middle line. An incision is first made through the skin in the median line from one to one and a half inches in length. This incision having been made, the underlying structure should be divided with the handle of the scalpel or taken up one at a time and divided on a director, so as to avoid wounding any of the large blood-vessels. When the isthmus of the thyroid is reached, it should be pushed up or down according as the operator desires to make a low or high opening, when the facia covering the trachea will be exposed. This should be broken up. All bleeding should now be stopped and the retractor inserted so as to lay bare as large a portion of the trachea as possible. The trachea is next hooked up with a tenaculum and an opening is made through it with a sharp pointed knife. The tracheal dilator is now introduced when the sudden inrush of air is apt to bring on a fit of coughing, during which the wound may be filled with blood and membrane. These should be carefully wiped away and the tube inserted and held in place by means of tapes around the neck.

The after-treatment in a case of tracheotomy is comparatively simple, but important. The air of the room should be kept warm (about 80° or 85° F.) and moist and free from dust. The medical treatment should be continued the same, and the physician should not relax his vigilance on account of the successful performance of intubation or tracheotomy. After intubation most patients have great difficulty in swallowing liquids. This is overcome by allowing the head to drop a little lower than the body during deglutition, when it will be found that fluids will be swallowed without difficulty. The time that the tubes should remain in place varies in different cases, but should be long enough to insure against a return of dyspnea.

I should like, in closing, to urge early operations in these cases. If there is any disease in which the child needs all its

strength and all the air it can procure it is in diphtheria, and the time to operate is before the strength has been taxed by unwonted efforts at respiration and the system poisoned by the accumulation of carbonic acid gas. While good surgery should always stop well within the limits of safety, there can be no conservatism in emergency work and I would plead in the name of the little lives intrusted to our care that we give them the very best opportunity for recovery.

Diphtheriana, A Review

By PARK L. MYERS, M. D., Toledo

"Experience is fallacious, and judgment is difficult"—Hippocrates and Osler. "All we like sheep, can and do go astray—pellmell—right or wrong."—Isaiah, *et al.* We are surrounded by upbuilding and down-pulling; by growth and decay; by health and disease.

Every evidence which the accumulating knowledge of man can muster, shows that we always have been; that death has gone hand in hand with life; that one structure grows as another declines, that one declines as another grows; that every form of growing manifestation is but a parasite to some other. It is a question sometimes which *is* the parasite, or rather which is the greater parasite. Surely it cannot be answered by "the one last created."

We sometimes say that the microbe has come to stay. We mean that we have just recognized him. He has always been here. He was probably first. While he has kept behind the curtain, he has been playing to large audiences since history began and before. His has been a continuous performance; and truly in his time, each microbe has played many parts, notwithstanding the early assertions of Pasteur and Koch.

The settings in the drama of disease are never twice alike; a change of costume should be reasonably anticipated. We have been tardy in recognizing our microscopic neigh-

bors. We have been tardy in recognizing many things. Pioneers are few. We only see a star after it is pointed out to us; then we often see it better than the discoverer. The ancients saw gods and animals in the starry clusters. You can see them, too, if you're told they are there.

You can see anything, anywhere, if you have faith, enthusiasm and a confident guide. It may be in the sky of stars, the microscopic sky, the deep vault of therapeutics, or the spacious realm of glittering statistics. One man tells what to see; what *is* (in a journal, perhaps) and it's so! We all, like sheep, follow a leader, pell mell, perhaps right, perhaps wrong. This makes up the world's experience, which Osler and Hippocrates agree is fallacious. Generation after generation we are wonderfully alike. Once it was evil spirits we saw; then it was bad blood humors; now it is homeopathy, Christian science, osteopathy, and some other things nearer home, which lead us wither? But we are evolving slowly. Each thinker builds a monument, from which the horizon is greater for his follower. Each enthusiast thinks he has arrived at the ultimate summit; but he hasn't; and that is why "Experience is fallacious and judgment difficult."

A dangerous throat affection has prevailed, epidemically, in many countries. Though described under various names, we now recognize in past literature an individual disease, hoary with age before the German empire saw light. Exorcised as a demon, shunned as a strangler, it appears to have held the old-time doctor at a worshipful distance. Not until the middle of the eighteenth century do we find it fastened in classic description. Fothergill led the way in 1756. Samuel Bard, of New York City, followed in 1789, but Bretonneau in 1826 won immortal fame by naming it "diphtherite," the disease of the false skin. In 1875 it was still classed as a constitutional disease by the revered Austin Flint. By 1880 we find it classed as a Miasmatic disease, "communicable, inoculable and propagated by a specific poison." Soon the world was aware

of the discovery of Heuter and Oertel of bacteria in the exudation and neighboring tissues. Then came Klebs with his accurate observations of the ever present bacillus and a year after, Loeffler, by cultivating the acquaintance of the little giant, coaxed him out "into the clear," and stamped the name of "Klebs-Loeffler" upon him. By 1890 Behring and Roux had evolved the toxins of the bacillus, and by 1892, barely 10 years ago, had launched "antitoxin" upon the world, by as brilliant a series of technic, physiologic, chemic and bacteriologic experiments as the world has ever appreciated. Behring, the scientist, led the way. The world of scientific doctors followed. Today a manufacturer of antitoxin says, "It is an axiom of medical science, that no remedy ancient or modern conquers contagion, as antitoxin conquers diphtheria." This is the result of 10 year's experience; but "Experience is fallacious." Is our progress all real? Is is not possible that in our enthusiastic chase for the bacillus we have "flown the track" of clinical caution?

Have we forgotten how long ago we cured all disease by transfusion? and later, how we induced perennial youth by the Brown-Sequard Elixir of Life. I would not prolong the citation of similar history; but while rejoicing with you at the wondrous progress made, and drinking in the wine of future glorious possibilities, I feel impelled in this survey to place before you a few Bromo-Seltzer draughts, which may keep us from getting too dizzy.

First, we have diphtheria, then diphtheritic croup, then follicular tonsilitis. All your authors tell you how clearly to differentiate these clinically. It is a singular fact that no one who writes on medicine, or collects statistics of their own, is other than a fine diagnostician. Of course Dr Osler tells you that there are cases that look like true diphtheria that are not diphtheria; and that there are cases which do not look like diphtheria, which *are* diphtheria. But evidently he must mean, that such cases look so only to other fellows. Ten years ago boards of health believed in our diagnoses. Five years ago, they began to make us

include our cases of membranous croup in the diphtheria groups. And now, since the bacteriologist has come to the aid of the board to make doubt certain, there is some thought of adding gingivitis and coryza.

Loeffler described a bacillus which he said was immutable and was club-shaped with polar granules.

The presence of this bacillus always produced one disease—diphtheria. Today, authors (Zeit and others) tell us the Loeffler bacillus is notable for its various morphology; that there are at least five forms of the true germ—and, oh, so many forms of the false bacillus!

To accommodate this progress, all late text-books start with a description of Diphtheria Vera, and in the very next paragraph of Diphtheria Pseudo. All immediately proceed to tell you how easy the differential diagnosis is. Dr Anders in his later editions describes them beautifully. He says, "The true diphtheritic membrane is chiefly a fibrinous exudate, necro-biotic mucous cells, some pus, etc.," which is easily removed. And "The pseudo-diphtheritic membrane comprises fibrin, pus, leukocytes, necrosed cells, bacilli and sometimes blood corpuscles"—worse than the true membrane.

Another writer (Dr R. C. Brown, Milwaukee, March 1, 1902) says, "the true diphtheritic membrane is adherent" (just opposite to Anders) "and cannot be removed by a swab." Then he further states that the Klebs-Loeffler bacillus is the only one to produce this strikingly adherent membrane. The solution comes clearer when you turn to the pages of McFarland's excellent treatise, where you can read that you can have the Klebs bacilli, and diphtheria, and yet have *no* membrane.

Still later comes a writer in the *Pediatric Journal,* Dr J. C. Cook, who tells us, as did Flint, that in most cases the clinical symptoms are alone all that is necessary to diagnose diphtheria. But he adds, "in uncertain cases we must depend upon the microscope." Then he proceeds to tell of 200 cases diagnosed diphtheria, but in 72 of which

Dr Martin could find no Klebs-Loeffler bacilli; and then he helps the subject by showing you pictures of five different kinds of true Klebs-Loeffler bacilli, tells you of the typical and atypical varieties, of the true and psuedo-forms, of the pathogenic and nonpathogenic germs, and finally, of true Klebs-Loeffler that produce diphtheria—and of true Klebs-Loeffler that produce nothing.

Yet when you find the true Klebs-Loeffler you must give antitoxin; and if you suspect Klebs-Loeffler, you must give antitoxin before you find them. A most portentious piece of information is that of Hoebners, that bacilli are to be found in throats showing no symptoms general or local, remaining for weeks, and yet so virulent that when cultivated and inoculated animals die in 24 hours.

Now we are ready for the statement that has recently emenated from a number of authoritative sources—namely, that, after all, the Klebs-Loeffler bacillus is not immutable: that its virulence and form depends on its cultivation and habitat; that it is a veritable Dr Jekyl and Mr Hyde; and the soil, therefore, has as much or more to do with the production of the disease than the bacillus itself.

Even the scientist Behring has lately come to the conclusion that the true and false diphtheria bacilli and the Xerosis bacillus are all identical. Endeavors to separate the true from the false are useless; for they are interchangable and depend for their variety on the soil on which they are grown. One needs make but little effort to believe the possible and plausible truth of the following statement in the *New York Record*, from the pen of Dr R. C. Brown, "I believe antitoxin is given ten times in follicular tonsillitis to one in diphtheria."

Well does Dr G. Frank Lydston say, "It seems to me that the conflicting observations on diphtheria should command caution, at least." But what can be said directly about the treatment of diphtheria by the antitoxin injection, the application of which was attested by a series of laboratory experiments that burst upon us like miracles, and

which has been followed by scores of statistic cures that are only rivaled by the claims of the Christian Scientists?

This: That with the dispersion of some of the supposed fundamental laboratory facts upon which the brilliant conclusions were based, we have a right, a duty, to review the treatment, and question the results we have so tumultuously accepted.

We are not so certain of some things as we were. Dr Victor Vaughn asserts that we even cannot kill germs as easily as we thought, and that sterilization of common milk is almost impossible, which leads Dr George Shrady to observe that the "present day knowledge of germs is not nearly so full and exact as believed by many." Surely we should be conservative in using the antiproduct of a germ, or of one of five or ten varieties of a typical or atypical germ, of which "our knowledge is not so full or exact as many believe."

True, eminent authorities claim this antitoxin to be harmless in any dose. While Dr J. C. Cook, in 99 rapid cures, found it never necessary to administer more than 3,000 units, my fellow townsman, Dr Moses D. Rabenovich advises as many as 50,000, and seldom gives less than 6,000. Dr Osler, in his last edition, enthusiastically and commandingly quotes Dr McCullom, of Boston, as advising 70,000 units; though under "untoward effects" he has not the courage of Dr Anders to tell of the few instances where death has followed an injection of antitoxin, though used only to immunize in entire absence of the disease.

I have attempted no collection of such accidents, if accidents we can call them. They are sad enough, and not so rare that few of the profession but know of at least a case, with possibly the exception of Osler and the manufacturers. One recent disaster recited by Dr Brown, of Milwaukee, is typical. His case was a young man, aged 30, who was not confined to his room, in whom a bacteriologic examination showed Klebs-Loeffler bacilli, who

after one injection in one minute was seized with a choking, and died in 10 minutes in convulsions.

Probably the statement of a young physician who had served one year in the Willard Parker Hospital, New York, quoted by Dr Adolph Rupp in last August's *Medical Record*, is about as arresting a statement as I have seen. Said he, "I am fully convinced of the utter worthlessness of the antitoxin treatment," and further, "the cases given 1,000 units did better than those given 4,000."

To recapitulate thus far, we have interminable confusion as to the differential diagnosis of true diphtheria; there is no substantial agreement amongst the bacteriologists themselves as to the differential recognition of the true from the pseudo forms of the Klebs-Loeffler bacillus. There are cases of serious membranous disease of the throat and larynx, streptococcic, in which the antitoxin injection is admittedly inadmissable. The remedy, while so harmless as to be homeopathic in most instances, has, in a few instances, proven dangerous, unexpectedly, and unexplainably, except to enthusiasts.

This review would not be complete did I not give some conclusions. In the great stream of scientific phenomena in which I have been floundering, while exploring the turbulent waters of diphtheria, I have noted a few fact currents which so far do not seem to lead to whirlpools. Some of our old currents have the danger sign over them; some of them have merged into others; some of our new ones are but old ones renamed; some few seem to be new. Asking your indulgence, I submit the following:

1. Life is a union of elements and conditions. All life is not from an egg alone. Lone eggs spoil.

2. The elements may be ovum, seed or bacillus. The conditions are soil, one of which is as necessary to life and growth as the other.

3. Given a Klebs-Loeffler bacillus and a proper mucous soil and you have a diphtheria. Without the proper

soil you no more have the disease than you have a wheat crop on an asphalt pavement.

4. Bacilli will not grow on normal tissues, bathed in normal secretions.

5. Modified secretions, attending so-called "colds," preceed all diphtherias not traumatic.

6. As the Klebs-Loeffler bacillus is "readily destroyed by both thermal and chemical means" (Abbott's Transmissible Diseases), and as it is one of the easiest therapeutic problems to render the throat secretions antiseptic, then

7. It is reasonable that in this affection the soil is as worthy of attention as the seed, or bacillus—or more.

8. All authorities agree that diphtheria is an epidemic disease, varying greatly in intensity at different periods. Flint records the "remarkable fact, that it was hardly known in America from 1771 to 1856."

9. Further, according to a biologic law, natural immunization is constantly going on.

10. If some authors are right, and most cases of sore throat show Klebs-Loeffler bacilli on examination, then most of us are immune.

11. These facts help wonderfully toward the beautiful statistics of Boston, Chicago and Toledo.

12. Chemistry in the last 10 years has given us a marvelous number of antiseptics which are equally marvelous in their power to destroy bacterial life.

Lastly, when, as in nearly every case, some one of these antiseptics is prescribed, either locally or systemically, then is "Judgment difficult," as to whether the results are derived from the powerful antiseptic, or from an antitoxin, which in 70,000 units is harmless.

DISCUSSION

Dr Wm. J. Mayo, Rochester, Minn.: I thank you very much for your kind invitation to speak on this subject, but it is one about which those who have taken part know a great deal more than I do, therefore I will not avail myself of the opportunity.

However, I do wish to say that I have been very highly instructed during the last few days in attending the meeting of the Ohio State Medical Society, and feel that you are to be congratulated upon the high character of the papers which have been presented. Each essayist seems to have some ideas which he wishes to bring forth, and such papers are of the highest class and productive of the largest amount of good. We are trying to bring out this character of paper in the Minnesota Society, limiting the time to 15 minutes for its reading, and have something which will be instructive to the audience.

I thank you for this opportunity of addressing your Society.

Dr A. J. Ochsner, Chicago, Ill.: I have very little to say on this subject, because as surgeons we rarely have to deal with diphtheria at the present time. When I began to practice medicine we were constantly called upon to perform tracheotomy, and if one out of three cases recovered we felt that we had saved one-third of the lives of patients suffering with this disease, because all of the cases which we were called upon to operate were hopeless without the operation. Since antitoxin has been used in Chicago I have performed two tracheotomies in cases suffering from diphtheria during a period of seven years. Both of those cases were performed because of accident. In each case intubation was tried. In one case the surgeon was not accustomed to the use of the instrument which he tried to use and injured the larynx and tracheotomy became necessary. In the other case I made the intubation myself and shoved the membrane down into the trachea and had to perform tracheotomy at once in order to relieve the patient.

My experience has been this: In any given case in which antitoxin has been administered early, if obstruction of the larynx occurred the membrane would be expelled after the intubation tube was in place for twelve to twenty-four hours and the patient recovered.

There are still cases of diphtheria which die, not from obstruction of the larynx, but from sepsis, and those cases are not surgical cases. They are cases which cannot be relieved by intubation or tracheotomy, consequently since the introduction of antitoxin diphtheria has changed from a partly surgical to an entirely medical condition. The practician now inserts the intubation tube without calling upon

the surgeon. Ten years ago the surgeon was called upon to do this, because at that time the probability or possibility of tracheotomy was always considered. Now it is so rarely necessary that the surgeon is practically never called upon to intubate. In my own experience, I am absolutely convinced that the antitoxin is a reliable specific if it is employed before the element of sepsis is introduced. Take a case of simple diphtheria, I believe unless the element of sepsis is introduced, the child will recover if antitoxin is used early.

My feeling in regard to diphtheria has entirely changed since the introduction of antitoxin. Before this I had a feeling of dread of the disease, and I felt that if my child should have diphtheria I would be practically helpless. Since the introduction of antitoxin my child has had diphtheria and I felt that if the antitoxin were given instantly my child was practically certain to recover. This opinion has resulted from my own observations in regard to diphtheria in Chicago, and from reading the opinions of men who have observed hundreds of cases in which antitoxin was used.

Dr James Tyson, Philadelphia, Pa.: I am sorry that I am unable to add anything more than the weight of personal opinion to what has been said upon this subject by the various speakers. There are two points in a consideration of this disease in which I have been especially interested, and they are first, the diagnosis, and secondly, the treatment by antitoxin.

There is no doubt but that in a great many cases we were able, before the bacteriologic test for diphtheria became available, to make tolerably correct diagnosis between follicular tonsilitis and diphtheria, and I have no doubt that if the practician adhered more closely than he sometimes does to those very clear text-book expositions which Dr Myers has referred to, antitoxin would be less frequently used than it is, and our cases would include more nearly the legitimate cases on which alone we can make out accurate estimate of the value of the treatment. I believe too that the serum is used in many cases acknowledged to be cases of pseudo-diphtheria or follicular tonsilitis because of a fear that true diphtheria may insidiously develop. I am one of those, who, while fully aware that a few instances of unexpected death have occurred from the use of the antitoxin, believe that even in cases of doubt the serum should be used. In the matter of injection for the purpose of immunization where

diphtheria is actually present I am not quite so emphatic. I feel that the contagion of diphtheria is a comparatively easy thing to control where the ordinary precautions are taken of isolation and disinfection of the oral cavity, and persons outside the sick chamber are comparatively safe, or may be safely protected. I have, therefore, never felt at liberty to encourage the use of antitoxin for immunization.

It is one of the interesting psychologic problems with which we have to contend that the human mind is so constituted that different persons will deal with the same facts and arrive at different conclusions. I think the paper of Dr Myers is a useful paper, but I think that it may also be a harmful paper, as tending to depreciate the value of antitoxin and discourage its use. In my opinion there can be no doubt of the truth of Dr Ochsner's statement that since the introduction of antitoxin and its more or less general use in the treatment of diphtheria, this disease has ceased to be a surgical disease.

Dr Thomas Hubbard, Toledo: There is one statement in Dr Park Myers' paper on which I would like to say a few words. He made the assertion that *he presumed that nearly every physician could give reports of deaths due to antitoxin if they cared so to do.* To be sure we all know of a few deaths, having read of the few authentic cases which have appeared in medical literature, but Dr Myers makes the insinuation that deaths due to antitoxin have been withheld from publication. It would add much to the value of his paper as a contribution to the scientific literature on the subject if he would give specific reference to even a few such instances.

Deaths from syncope occur in all stages of diphtheria not necessarily due to toxic cardiac paralysis. For instance, a child, weakened by the sickness or hard-pressed in more or less severe dyspnea, would scarcely be expected to recover from a fainting spell, leaving toxic paralysis out of the question. I have seen children faint away at sight of intubation instruments, and in one case in which I luckily persisted in placing the tube, the child rallied about 10 minutes after we had given up efforts at resuscitation. Had not the obstruction been relieved the patient could not have reestablished respiration. This was not a reflex inhibitory phenomenon, but apparently a syncope from fear. Other cases have died under the same conditions and judging from the period of sickness it is not probable that it was due to

toxemia. The point which I wish to make is that had I had an antitoxin syringe in my hand instead of an intubation instrument the fainting or death might in a prejudiced mind be charged to the antitoxin.

But after all Dr Myers' paper will give a proper stimulus to the clinical study of antitoxin independent of the influence of that class of literature written solely in the interests of the manufacturers.

Dr John P. Sawyer, Cleveland: I am unwilling to let pass from the active membership such a challenge to medical opinion as has been given this morning. I was in doubt at first as to how seriously to take the paper which we have just heard. My appreciation of the gentleman who wrote it is so high, and my enjoyment of the "side lights of medicine" so great that I sympathize with much that has been said by him. Fortunately what he has said in his paper does not get out of our transactions, it does not reach beyond the ears of those assembled here. It might be copied in some of our St. Louis journals, or similar trade publications, and given an undue weight and authority. I would like to ask Dr Myers why it is that so many practicians have had such a different experience from his in the use of antitoxin?

I know that each man when he writes a paper, or makes remarks, not only emphasizes a statement which he wishes to bring out, but he reveals to a certain extent his mental processes or shows that he has been subjected to some unusual circumstances. I hope that the latter is true in this particular instance.

I wish to add what little I can in favor of the use of antitoxin. Perhaps being more venturesome than the distinguished gentleman who has spoken, because of the faith which bids one dare, I have found great comfort in the use of antitoxin as a prophylactic with the nurses, with the mother, and those in the house directly exposed to the infection of diphtheria. In an experience with a great many cases of diphtheria I have not known of one case of infection of any member of the household from a diphtheritic patient whom I was called upon to treat. My experience with this disease in comparison with many of the gentlemen here today is brief, but there are many present with us in this hall who have seen the change of professional opinion in regard to the treatment of diphtheria, as Dr Ochsner has referred to it. I have seen as a beginning practician, and also as a student

under my father's care, a number of cases of the most virulent forms before antitoxin was known, where whole families were wiped out, and I have seen in comparison other families affected with the disease upon whom antitoxin was used, and the families have not been wiped out. No one who has seen the effects of quinin in malaria can doubt its specific action and there is a strong parallelism between this specific action of quinin and the specific action of antitoxin in diphtheria.

Finally, I wish to urge not only the use of antitoxin for the patient affected with diphtheria, but wish also to urge its use as a prophylactic for those who have the care of the patient, and also in those cases where the diagnosis is uncertain. Those of us who have seen the fulminating form of appendicitis realize with what astonishing rapidity the disease may develop, and the same is equally true of the fulminating forms of diphtheria. It was only recently that I took cultures from the throat of a patient, and before I could make a diagnosis from the cultures which were placed in the laboratory, the disease itself had advanced so far as to make the diagnosis unmistakable. In this case the prostration of the patient was great, and it was one of the cases whose course was calculated to convince me, and two others who saw it, as to the value of sometimes giving antitoxin before the tube cultures clinch the diagnosis of diphtheria.

I am strongly in favor of urging the use of antitoxin exactly contrary to the spirit, or to the effect of the paper, whatever the spirit was.

Dr Chas. S. Judy, Miamisburg: There was one thing in the paper by Dr Myers in reference to the treatment of diphtheria that I could not endorse, and that was the use of the swab. I think if the treatment for this disease is properly carried out it will not be necessary to use a swab. In this matter it seems to me the treatment is behind the times.

In reference to the use of antitoxin I think this ought to be used as soon as the diagnosis is made.

Dr Freeman D. Case, Ashtabula: There is one point about which I wish to speak, and that is in reference to the detachability of the diphtheritic membrane. This point was touched upon by the essayist. My experience has been that at the beginning of the disease it is readily detachable, but after 48 hours it is not. Seven years ago I had the pleasure

of presenting to this Society a paper on an epidemic of diphtheria which occurred in our city, which had two peculiarities, one of which was that the disease was caused by infected milk, and the other that it was the first instance in this country in which antitoxin was used in an epidemic of diphtheria. In 1894 there were 111 cases of diphtheria with 25 deaths. Of this number 100 cases occurred within four weeks in families taking milk from one milk wagon, and 21 of the deaths occurred out of this 100 cases. Out of all the cases in which antitoxin was administered (amounting to 54), there were only four deaths, and in those four cases of death the antitoxin was administered something like five or six days after the patients were taken ill. There was not a death occurred where the antitoxin was administered within the first four days. The story is told that at one time a history of Ireland was written in which one chapter was devoted to the subject of snakes and read about as follows: "There are no snakes in Ireland." So far as the medicinal treatment of diphtheria is concerned, where the case is seen before sepsis is present, there is practically no medicinal treatment save the use of antitoxin; and when I say this I am speaking not only from my own experience but from the experience of every physician in Ashtabula who went through the epidemic of which I have just spoken.

There is one other point about which I would like to say a few words, and that is in reference to the use of the concentrated antitoxin. It has been my experience, and also that of my friends in my home city, that the use of the concentrated antitoxin is not attended with the skin trouble that the more dilute preparations which we first used produced. In those cases in which skin trouble manifested itself it was in the form of a severe erythema, or urticaria, and sometimes symptoms analogous to rheumatism were present, but when the more concentrated solutions were used these symptoms rarely appeared.

It is my practice to give antitoxin if I have any reason to suspect the case may prove to be diphtheria. I give the patient the benefit of the doubt. I do not wait until I have made a culture, but as soon as I suspect that it may be a case of diphtheria I give antitoxin, and give it in large doses. I never give less than 3,000 units to a child five years old and not less than 2,000 units to a child of any age younger than five years. The dose should be repeated in 12 hours if the

symptoms have not improved in that time. Frequent spraying of the throat is indicated as a matter of cleanliness and adds greatly to the comfort of the patient.

Dr J. C. Crossland, Zanesville: I am aware that there is a feeling on the part of some physicians that the advocates of antitoxin are careless in their differential diagnosis, and are disposed to use antitoxin in all cases of throat trouble. I do not believe that this is true. On the other hand, I think the reverse is true, that physicians who use antitoxin are more careful in making differential diagnoses, and more painstaking than those who do not use it. Recently, within 48 hours following two double funerals of children dead of diphtheria, I saw in my visiting practice just one dozen children suffering from throat trouble, all of whom were sick enough to justify calling a physician to the home, and all of whom were suspected of having diphtheria. There was not a single case of diphtheria in the entire number. They were cases of follicular tonsilitis, simple tonsilitis, pharyngitis, and one case of suppurated tonsilitis. I saw, the latter part of last week, two children in one family suffering from tonsilar disease, in which the conditions showed clearly that the exudate was primarily follicular. There was a cobweb-like exudate over the tonsils, and the parents suspected diphtheria. They wanted antitoxin administered, but I did not use it, believing the condition not to be diphtheritic. It is not my practice to use antitoxin until the exudate develops. I desire to express my pleasure at the endorsement of my views on the treatment of this disease by such celebrities as Drs Tyson, Ochsner, and others.

Dr A. V. Paterson, Mansfield: I only wish to add my endorsement as to the efficacy of antitoxin. I began to use it under compulsion, as I did not want to use it. One day another physician asked me to visit a case of his and give it a dose of antitoxin and see what it would do. I did it with a great deal of reluctance. After I had given the injection I went to see the case through and watched it very carefully, kept a temperature chart, etc., and was so gratified with the result that I have been using antitoxin in every case since. In nine years' practice I have not lost a case of diphtheria, probably due more to special providence than a special method of treatment. I myself have had a personal experience with antitoxin. Monday I contracted diphtheria from

a case of membranous croup. I went to bed and in the evening of the same day I had antitoxin used on me the next morning, and on Friday I was in the office at work. That is evidence enough to me of the efficiency of antitoxin. It is not what one man says—it is what the men of the country say after having had experience in a great number of cases concerning the merits of any drug. Now in the use of antitoxin it seems to me that the great reduction in the death rate should lead us to form a correct opinion as to the merits of antitoxin. I know that there are different opinions as to its use—some men of prominence use it in every case; others do not, but the same objections which are advanced against antitoxin could be advanced against vaccination. We have deaths occurring from vaccination, more deaths than from the use of antitoxin, but no one doubts or discontinues the use of vaccination on that account. I cannot believe that any of the deaths attributed to antitoxin were caused directly by antitoxin. Some of the patients whose death has been attributed to antitoxin have been reported to have died within a few minutes after its introduction into the system. If it were such a powerful poison it would cause the death of many more cases. I think possibly the deaths might be due to the introduction of a half a syringeful of air when the antitoxin is injected.

Dr Park L. Myers, Toledo, closing: Mr President,—When, in reply to your request for a paper, I suggested an antitoxin article, it was hinted by you and other friends that if I should read such an article before this Society, I might expect to "get it" where diphtheria usually locates. Hence I was prepared for antagonism. Yet, I want to thank the gentlemen for their fair and kindly criticism. One gentleman (Dr Sawyer) has suggested that my article was one written in a spirit of ridicule—that my experience must have been limited, or very peculiar, to make such an article possible. I protest, however, that my spirit was not that of thoughtless or malignant ridicule. True, I try to keep myself alive to the ridiculous—the ridiculous in myself, I hope, as well as that of my fellow-man,—my fellow-parasite. It is a great corrective, none better. I thank Dr Tyson for calling my paper a study in the psychology of disease recognition and treatment. Such it was intended to be; diphtheria being taken only as an instance.

I have had some experience; may be it has been peculiar,

Yet I have no right to think my experience exceptional, however peculiar my interpretation. My friend, Dr Hubbard, dislikes my "insinuation of danger in the use of antitoxin." I thought I touched this phase very carefully. I emphasized the harmlessness of it, even calling it homeopathic. I spoke of but three cases, the two mentioned by Dr Anders, and one which was reported from Chicago. I could have given others had I deemed it necessary. I might have given two very curious cases which came under my own observation. But I am enough in accord with my fellow practicians to believe these cases accidents. Honestly though, *inter nos*, isn't it good that the Lord (or accident) always stands ready to lift the burden of our failures, while our science or skill so easily carries the successes?

Dr Crossland gives statistics of 30 cases in which injections for immunizing were given, in no one of which did diphtheria follow. I can recall a number of cases of diphtheria in 22 years' practice. I have had three deaths in my own practice. I think I can safely estimate that in these 22 years I have known of at least 200 children exposed to diphtheria contagion, in not one of whom was an immunizing injection used. And yet (and maybe this is my peculiar experience) I have never had two consecutive cases in any family. Above all, I insist that in this inquiry I have had not other motive than the advancement of truth. And if I have failed, it is only because that I, in common with my fellow mortals, am subject to the great axiom of Hippocrates, *viz.*, "Experience is fallacious."

Practical Deductions from Experiences in a Hospital for Pulmonary Tuberculosis

By B. F. Lyle, M. D., Cincinnati

I wish to express to our honored President my thanks for suggesting a title for my paper when the order came to appear before you today.

His desire for deductions rather than statistics shows the profession is already aware that males as a rule have the

disease later in life than females, and in colored people it occurs earlier than in those of the corresponding sex of the white race. We are also aware of the pernicious influence of improper sanitary conditions and know that a stranger visiting an unknown city can, by an intelligent survey, judge of the locality where tuberculosis, crime and intemperance can be found to the greatest degree.

Why couple tuberculosis with crime and intemperance? Because tuberculosis is primarily a result of physical degeneration, inherited or acquired, and this same physical instability leads to that dwarfing or obtunding of the mental and moral powers which results in crime and intemperance. Some disciple of Malthus may therefore, because of these connections, regard tuberculosis in the light of a public benefaction, and, with Spartan-like indifference to the sensibilities of the individual, look upon the elimination of the physically weak as a means for the upbuilding of the welfare of the State.

No benefit can be derived from this method of elimination. Tuberculosis is the penalty for the disregard of sanitary and hygienic laws, and its subjugation rests not with the physician, neither with the law-maker does the remedy lie. It can be largely secured by an enlightened public sentiment which will regard with horror our dark, decayed and musty tenements, the curse of child-labor, sweat-shops and insalubrious work-rooms with their usual accompaniment—low wages.

Our statistics show that individuals of the colored race and of foreign birth, the dwellers in our worst tenements, are in evidence in a ratio far beyond that which they bear to the rest of the community in the census returns.

Thus we come to the principal factor in the causation of consumption—ignorance. Perhaps we should also add the cupidity of those whose philanthropy does not keep pace with their knowledge.

To our public schools we must look for the general

enlightment which will enable us to eliminate the predisposing factors of consumption.

The teaching of hygienic and domestic sciences in the district schools, sanitary inspection of the schools by competent physicians, popularization of public baths, placing of school buildings in proper sanitary conditions so that children can be brought up to appreciate the advantages they offer, are some of the innovations that are necessary.

A lady interested in charitable work visited a grocery in the slums about the noon-hour, articles were purchased not with reference to their nutritive value but their ease of preparation. These, supplemented by a bucket of beer, furnished a meal insufficient to supply the needs of the body. Is it any wonder that the cravings of hunger lead the toilers of the family to resort to alcoholic beverages in a futile effort to sustain their physical powers?

The objects of a municipal hospital for the care of the tuberculous are three-fold: First, to furnish an abiding place for the incurable, where they can receive kind and skilful care, and where they will cease to be a menace to their families; second, to give a helping hand to those who are able to overcome the disease; third, to instruct the patients and public in methods of caring for the sick, and avoiding contagion, and also show the necessity of proper hygienic and sanitary rules.

Consumption with impartiality visits all ages and all conditions of man. Necessarily we have in a public hospital persons of all degrees of culture and temperament. For practical purposes we may classify them as the earnest, the restless, and the indifferent.

The former are the ones who are ambitious to resume their vocations and are willing to assist in every possible way the efforts made in their behalf. In this category we find the sole bread-winner for parents, wife and children, or the mother who has left her little ones in the temporary care of another. This is the class for which it is the special province of the hospital to care. It is sad to see these

patients leave the hospital after only a few weeks stay, in which time they have gained a little strength, because they can no longer resist the pleadings for help of those depending on them. The care of the helpless ones must be looked after if we wish this class to be benefited by the public beneficence.

Many people are naturally restless and disease increases this number. These are the patients who derive but little benefit from any institution as they are unwilling to await results, or even assist in securing them. If the Utopian plan of sending tuberculous patients to some central point is ever realized, a large fund for transportation must be provided for this class.

The indifferent bring wrinkles and grey hairs to the attendants, and are an imposition on the public. The motives which animate their actions are inscrutable and the results are frequently disastrous.

Let me illustrate to those of you who are not initiated a few of the difficulties with which we have to contend. A "stretcher case" is brought in, by careful attention in the course of a month he is able to get about, in two months more he has gained 20 pounds, and is the pride of the institution. He receives permission to go home for a few hours to see his family, a message is received later that he has been taken suddenly sick and not able to return. Several days after the ambulance brings in what remains of our patient after a prolonged debauch. The dyspnea due to a dilated or flabby heart is increased by the surreptitious use of tobacco, the cough due to an irritated throat aggravated by smoking, or the intractable diarrhea placated by means of a mince-pie.

Discouraged and faint-hearted, time gives you courage, and you take up the broken threads and renew your efforts. In the presence of one class however, exempt, because of the nature of their infirmity, from the ordinary 60-day rule, our courage fails. These are the indifferent chronics. They are a peculiar and unique class. Their only object in life is

to be well fed and cared for. Their digestive abilities are unequalled and they are enabled to dispose of any and all kinds of contraband articles with impunity. When asked to render a service the ever-present pleuritic pain comes to their relief or a sudden attack of dyspnea renders the slightest effort impossible. If I may I will take the liberty of giving a warning. Never turn a hospital for tuberculous patients into an infirmary. Intemperance and syphilis are predominant in the personal histories of our patients. Pneumonia is noticeable as a predisposing factor. Influenza has not seemed to be of as serious import as is usually reported. Confinement in general hospitals for some time seems to be important, we are never without several patients who have but recently occupied beds in the surgical or medical wards. One-third of the cases have a family history of tuberculosis. The disease has occurred in the mothers twice as often as in the fathers. How far contagion acts as a primary factor in the disease is a question now occupying a large part of the attention of the profession. The cases reported by Weber are significant in this connection, nine husbands tuberculous before marriage lost eighteen wives; one lost four in succession, one three, four lost two each and three one each. The wives were healthy at date of marriage, and, with one exception, were free from hereditary predisposition to the disease.

We frequently obtain a history of infection of husband and wife from the opposite marital partner when no family history of the disease exists.

Owing to various reasons six mothers with consumption have brought their infants with them to our hospital. In one case the child was born at the hospital. These children have invariably had tuberculosis. The one born at the hospital died of general tuberculosis at the age of 78 days; this was no doubt congenital. Another aged 15 months died after an apparent illness of 90 days. The disease in all cases has been general, the lung trouble was far advanced. The method of infection is uncertain as a

rule. In one instance it was probably due to the mother masticating the food previous to giving it to the child. Her sputum showed about 50 bacilli to the field. The fact that all of these children have had tuberculosis may be unique. It serves, however, to illustrate the danger of allowing infants to be cared for and caressed by tuberculous mothers and nurses.

We are constantly reminded of the unreliability of the statements of patients regarding the duration of the disease. Cadaverous-looking individuals, with flat chests, clubbed fingers, edematous feet and all the symptoms and physical signs of a universal lung involvement will frequently state they have been sick but several weeks or possibly months. Their early demise frequently leads to contentions between their friends and the industrial insurance companies when a policy has been in force but a few months. I have frequently endeavored to have the patient modify his statements after making a physical examination, but he will usually insist on the correctness of the history he has given. This fact accounts for the variability seen in statistics giving the average duration of the disease, our statistics give 13 months as the average duration of the disease in applicants. Our records show women contract the disease earlier than men. Colored persons contract the disease earlier than white persons of the same sex. Our statistics of 1,000 cases show the averages to be: white males, 39 years; colored, 38 years; white women, 35 years; colored, 27 years.

About 90% of our cases have been of the fibrocaseous variety, 9% of the fibroid form of the disease, while acute miliary tuberculosis of the lungs, and lobar caseous pneumonia are rare. All patients have pleurisy, the dry variety, seldom with effusion. The large majority of persons under 20 years of age have a more or less extensive involvement of the lymphatic glands. General tuberculosis is more likely to occur in the young.

Next to the lymphatics we find the frequency of tubercular complications of other organs in the following order:

larynx, intestines, pharynx, joints, kidneys, peritoneum, bladder, meninges, and testicles. Other complications which are present so frequently as to almost constantly require attention are indigestion, faulty circulation due to myocarditis or a dilated heart. When the patient is quiet dyspnea seldom occurs except from this cause. While the majority of patients give a history of hemoptysis at some time during the course of the disease it is rarely an important complication. Death is not caused by it in more than one patient in 200. Five per cent. have at some time had one or more hemorrhages in which the loss will exceed four ounces. Chills and fever occur frequently in some cases without any marked periodicity. Night sweats are usually only profuse and exhausting when the sanitary surroundings of the patient are poor.

The temperature is rarely above 102° when it reaches its maximum height. This is usually late in the afternoon. When the maximum temperature is higher than this, a marked remission frequently occurs, the difference between the maximum and minimum sometimes being seven degrees. The frequency of the pulse seems to depend more on the cardiac tone than the degree of temperature. The respiratory rate is influenced early in the disease by toxic conditions; later the amount of lung involvement plays the principal role. The influence of the rapidity of the progress of the disease must also be considered in this connection.

The loss of weight which many patients undergo is considerable, from one-fourth to one-third is the amount of diminution in advanced cases.

We are told that the ability of a physician can be gauged by his prognostic powers. I therefore take the liberty of advising all who pride themselves upon their pre-eminence in this direction to be extremely oracular in their predictions when speaking of pulmonary tuberculosis. In early cases wait for results and in apparently moribund ones never fix the date of death. Familiarity with consumptives leads one to regard the prognosis of the disease in a

much more favorable light than that in which it is seen by the profession in general.

That the dire consequences of the disease are not always realized is evidenced by the numerous sanatoria making their appearance throughout the country. These indicate the growing confidence of the public in our ability to cure the disease. Cincinnati has generously maintained for five years an institution of this kind. How long will the remaining portions of the great Ohio State withhold their assistance to those who are suffering from pulmonary tuberculosis?

I will not ask you to find your way through the labyrinthine ways which the polytherapeutists and polypharmacists indicate as the road to success in the treatment of pulmonary tuberculosis. Their efforts have been useful, as the relics of their labors serve to keep us from treading in the same paths. As we turn from the contemplation of the bewildering array, untrammeled by the hope of obtaining a specific remedy, we can view our task in the proper light.

The tendency of the profession at present it not to exhaust all efforts in futile attempts to destroy the tubercle bacillus. In fact, the bacillus is being relegated to a far less prominent position. Always present at the end of the race, but an interloper after the start was made.

Physical and mental depreciation due to inheritance, faulty hygiene and sanitation, insufficient food and rest, pernicious habits, debilitating diseases or prolonged and fatiguing mental strains are the factors which equip the individual for the role of a consumptive.

Since the recognition of these facts our results in the treatment of the disease have been marked. Were it necessary to promulgate a creed, mine would be: "I believe in the inherent ability of the cells of the body to maintain the tissues in a healthful condition, both by destroying disease-germs and neutralizing the products of their activity. In order that this be done the potency of the cells must be maintained at the highest standard."

This condition can be effected only by having the air which enters the lungs free from the deleterious gases due to combustion, decomposition or exhalations from the lungs, by absence of undue humidity and by freedom from suspension in the air of various organic and inorganic particles. Probably still more important is the necessity of having the air exposed to the vivifying influences of the sun. The necessity of an intelligently selected dietary, properly prepared, is self-evident.

The deleterious influence of alcohol on cell-function and metabolism and the pernicious influence exercised by tobacco on the upper respiratory tracts, as well as on the heart and general nervous system, are so well known as only to require mention to secure a recognition of the necessity for the discontinuance of their use.

No easy road has yet been discovered to the diagnosis of pulmonary tuberculosis. A careful, methodical physical examination is still our chief assistance. In the early stage of the disease when with slight dullness we have only a prolonged expiratory sound or slight crepitation due to a localized pleuritis one hesitates to make a positive diagnosis. A sputum examination will then be negative as tubercle bacilli are rarely seen until after the infiltrated tissues begin to break down. Streptococci, staphylococci and the micrococcus tetrogenes are much more apt to be found. One ought never to exclude the presence of tubercle bacilli from the sputum because of their absence in one or two examinations, frequently the fifth or sixth will give a field of a hundred germs. Of even greater importance is the use of the thermometer. Every consumptive during some portion of the day has a rise of temperature. A chart showing the temperature taken every two hours is very significant if it covers a period of seven to 10 days.

Five years ago when studying the character of the pulse of some of my patients at the hospital with the sphygmograph I made a tracing of the pulses of several of my friends, two of them resembled those of the tuberculous

patients. Both of these gentlemen have been under treatment for consumption for the past three years. A rapid and weak pulse should always be given consideration.

An examination of the blood is sometimes of interest, although never of pronounced diagnostic value. A comparison of the blood of patients with chronic and acute suppurative diseases, represented by consumption and smallpox, shows the following:

	Red.	White.	Large Lymphocytes.	Small Lymphocytes.	Polymorphonuclear.	Eosinophiles.	Mast Cells.
Phthisis.....	4,216,000	11,765	7.6%	15 %	73 %	3.7%	.7%
Smallpox.....	5,000,000	11,514	12.6%	33.3%	47.7%	6.4%	.7%
Normal.....	5,000,000	7,500	5 %	25 %	65 %	3 %	.....

Nucleated red corpuscles are frequently found in pulmonary tuberculosis. Mast-cells are found in the blood of half of the consumptives and in 95% of the smallpox cases. Polymorphonuclear neutrophiles are found in largest number in individuals with cavities in the lungs. (I am indebted to the Interne of the Hospital, Dr Sater, for the examinations.)

The results of the examination of the urine are only of general significance. If the patient has a high temperature and a considerable area of lung is involved the amount of urea excreted may be double or even triple the normal amount. Albumin is also frequently present under the same conditions. It is not of particular prognostic significance and seems to be due to the local changes in the kidneys caused by the toxemia present.

When lack of time does not permit a delay in making a positive diagnosis tuberculin injections are permissible. If the initiatory dose of one milligramme does not cause a rise in the temperature of two or more degrees, larger doses of from three to 10 milligrammes may be given. A period of three days should elapse between the injections.

It is unnecessary to dwell upon the treatment of pul-

monary tuberculosis. The profession is rapidly coming to the conclusion that we have no specifics. However, I will venture to criticise a practice now quite prevalent. I refer to the treatment of all cases by the same means and methods, a practice not far superior to that of prescribing patent medicines.

In no other disease do the conditions call for such a variety of procedures. Of paramount importance is the sustenance of the patients which can be secured only by watchful care to preserve the functional abilities of the digestive tract.

The old adage that "health is wealth" is recalled to mind as we watch the elusive efforts to acquire the former by the methods of obtaining the latter. I refer to what I think in mining parlance is called prospecting. I am told that $3.00 is spent for every dollar of gold mined. The locating of mining claims is carried on with a certain amount of judgment. What can we say of the thousands of consumptives who are today scattered broadcast over our land, searching for health without any knowledge of the way to obtain it. The futility of combining with a diagnosis of consumption orders to leave home is forcibly brought to the notice of a physician of a tuberculosis hospital. Climates like drugs should be prescribed with discriminating judgment and likewise should not be ordered if the patients lack the financial ability to obtain them. A scientific knowledge of consumption will show us there is no El Dorado for the tuberculous and that in the sunshine, fresh air and congenial surroundings of our own localities, when associated with proper hygienic and sanitary conditions, our patients will find their most favorable opportunities for recovery.

The laudatory accounts of the value of the X-ray in pulmonary tuberculosis led me to use it. For diagnostic purposes it undoubtedly is very useful in supplementing or modifying the findings of the physical diagnosis. The normal excursion of the diaphragm is found to be diminished on the affected side. The density of the shadow is pro-

portionate to the degree of involvement of the lungs and pleura. It rendered invaluable services in persons who have had pneumonia a short time previously, pleurisy or bronchitis or who have valvular lesions of the heart, for many of these cases present symptoms and physical signs that are very suggestive of tuberculosis. I have not found it of value in locating cavities in advanced cases; as the contents of the cavities, the consolidated infiltrated lungs tissues surrounding them and the thickened pleura were sufficient to compensate for any loss of lung tissue. The use of the X-ray for therapeutic purposes was disappointing in 15 cases in various stages of the diseases in which I gave it a thorough test. Its effect on relieving pleuritic pains was marked.

It is unnecessary to specify the various drugs used to combat annoying symptoms. Remember, however, that by temporarily relieving the patient of a symptom we may use drugs that have a bad general effect. The chief ones in this category are opium and alcohol.

The Treatment of Pulmonary Tuberculosis

By Starling Loving, M. D., Columbus

I have absolutely nothing new to offer concerning the treatment of the disease named in the caption of this paper, but I wish to express briefly my own views founded upon reading and a lengthy and somewhat extensive experience.

It is fortunate that the infective power of the tubercle bacillus is comparatively feeble. Were it so strong as that of the germs of some other diseases, smallpox for example, all endeavor to prevent its dissemination and to control its effects would be useless. But understanding as we do, in a measure, the limits of its infective powers, and the inherent power of resistance to its ravages constantly shown by the human organism, and knowing that many recoveries

occur through the unaided efforts of nature, and through the efforts of nature aided by our art, there is strong encouragement for us to continue the effort which began almost with the dawn of time, to overcome the most persistent and dangerous enemy of our race. The experience of the ages past has demonstrated the uselessness of all special and, in large measure, of all medication, and we are forced to consider prevention and general sanitation as the only means by which we may control the malady.

Since the discovery of Villemin and the more recent advances in sanitation, much has been done in the way of prevention, but, while through the influences mentioned and perhaps others not yet well understood, tuberculosis is diminishing in all civilized countries, much more must be accomplished before it can be said that it is even measurably under control; for it is still the cause of seven percent of the total mortality of the earth. To forward the end it is necessary that we of the medical profession shall extend our own knowledge and that we instruct the laity in regard to the communicability of the malady and the steps necessary to prevent the dissemination of its cause. When it is generally understood that the disease is directly communicable through the depraved secretions of the infected body, mainly through the expectoration, and that the sufferer disseminates the contagium as he walks, it is to be hoped that the main source of infection may soon cease to exist. When it is understood (as has been the popular opinion in Italy for 400 years) that a tuberculous member of a family is a constant menace to all other members, and the invalid is placed for the night in a separate chamber, another fruitful source must cease.

It should be generally known also that infection is not conveyed by contact, through halitus gaseous connections, nor through the expectoration or other secretions when moist, but mainly through the expectoration after it has fallen upon the ground, become dry, reduced to the pulverulent state, to be borne with the dust by the winds in every direction and

often to great distances, to find entrance to the body through the respiratory and possibly other mucous surfaces. What has been stated in regard to the presence of the bacillus in the expectoration is true also of the excretions from the intestinal canal, the kidneys, and possibly of the perspiration, and in order that the danger of infection may be reduced to the minimum, not only the discharges from the lungs but those from other parts should each day be carefully collected and disinfected or destroyed by burning.

The widely prevalent opinion that the infection may be conveyed through articles of food, particularly milk and the flesh of tuberculous animals, though it may not be well founded, as appears from recent experiments, demands consideration, for though the bovine and the avian bacillus be not communicable to man, milk and meat from diseased animals cannot be considered wholesome, and, though thorough cooking destroys the tubercle bacillus, both should be rejected like other tainted articles of food. If the infection cannot be conveyed from animals to man through their flesh and milk as taught by Koch, the *medical profession is responsible for the unnecessary expenditure of vast sums of money* and much discomfort and mental distress.

Much help is gained from the influence upon the general health and upon the bacillus by the free admission of light and air into habitations of all kinds, and the avoidance of crowding. The notable diminution of tuberculosis in London, Boston, New York, and other large cities may be attributed in a large measure to the improvement in the dwellings of those cities. Dwellings which have for a length of time sheltered one or more persons suffering from the disease eventually become infected and the surviving members of the family should be warned and appropriate measures for the destruction of the bacillus taken.

The public should be taught that cleanliness of person and premises and the avoidance of excesses, especially in the use of alcoholic drinks, are strongly protective against all diseases, tuberculosis included.

Climatic and Hygienic Treatment. While the number of cases is undoubtedly reduced by preventive measures, climatic and hygienic treatment affords the only hope after infection.

Change of habitation is often followed by speedy improvement, and, if associated with other appropriate measures, is often sufficient for the cure. Except so far as the personal comfort of the patient is concerned, the results obtained in various countries seem to prove that the choice of climate (avoiding extremes) is not important; but other things being equal, it is better to select a locality where the patient can spend a great part of the day in the open air without discomfort, and consequently most patients should be sent, say from Ohio, to a more equable or warmer climate, the choice being governed by the condition, and often the preference of the patient.

Residence in Florida is objectionable because of the liability to malarial infection, but residence in the southern part of the State, say Palm Beach, during the winter months when mosquitoes are less abundant, is to be preferred to residence in Ohio or any of the States so far north. The climate of California is also better than that of Ohio, but most points on the coast are objectionable on account of the difference between the temperature of the day and night, but some of the interior valleys, while too hot during the summer, are admirably adapted for winter residences. Owing to the greater dryness and cleanliness, and, as many think, the altitude, the climates of Colorado, New Mexico, and Arizona is beneficial, as proved by the results in thousands of cases. Unfortunately, the number of persons who have gone to Colorado is so great that the bacillus (as in Minnesota, which 40 years ago was considered better than any other resort) has become implanted and tuberculosis originating there is as common as elsewhere, and while many thousands who still go annually with the hope of recovery are cured or benefited, the effects of the changes are not so notable as in former years. Fort Bayard and Las Cruces in

New Mexico, Tucson, Phoenix and Yuma in Arizona are becoming popular and are undoubtedly good localities for winter residence. Within the last year or two, typhoid fever has become rather common in Phoenix and is of course a menace to all susceptible persons. Where suitable accommodations are obtainable, the interior of the central portions of Cuba, the Isle of Pines, and the Tierra Templada, Mexico would be almost ideal localities. Many have been benefited by a sojourn at Orizaba in Mexico. The climate of the Bahama Islands is remarkably favorable, especially for neurotic and excitable subjects and those who suffer from hemorrhages and cardiac lesions, but the isolation of the group and the lack of accommodations, except in the city of Nassua, causes one to hesitate before recommending those Islands to any except those of adventurous turn. Of northern regions, judging from statistics and, to a limited extent from personal observation, I am of the opinion that the western portion of Oregon and that of the State of Washington, although in the latter the rainfall is very great, deserve more attention than they have had, and that both regions will eventually become popular. Many persons suffering from hemorrhages, after having failed to get relief in other places, have recovered at Tacoma and on the islands in Puget Sound. Many persons suffering from subacute and chronic bronchitis have recovered during sojourns on the north shore of Lake Superior where the air is singularly pure and bracing, and doubtless, when suitable accommodations have been provided, that region will become a favorite resort for persons suffering from tuberculosis.

European physicians, regarding purity of atmosphere rather than temperature, select almost extremes of climates. Davos, and St. Moritz in the Engadine, with a dry and cold but pure atmosphere, are popular resorts with excellent accommodations, and many attest the benefits of prolonged residence in the one or the other place. The southern parts of Europe, including the Riviera, the Ionian Islands, Egypt,

Algiers, in North Africa, the island of Madeira, are all regarded with favor, though the latter, owing to constant heat and to the implantation of the bacillus, is not so popular as in former years, and Algiers is lacking in suitable accommodations.

The British physicians early recognized the benefits of the climate of southern Africa. Residence in the interior of Cape Colony, and particularly in the Transvaal, which has an elevation of between 5,000 and 6,000 feet, and dry pure air, has proved curative in numbers of cases.

The location selected should be as nearly as possible free from dust, not subject to sudden and extreme changes of temperature, and protected from high winds. It is claimed by many that high altitudes affect patients favorably in more than one way; but it may be stated in brief that the benefit is mainly, if not solely, due to the necessity for more thorough expansion of the lungs for the full supply of oxygen and the complete aeration of the blood. Other advantages, except that the air of mountains, from sparsity of population, is generally free from infectious organisms, are fanciful and unworthy of consideration. Equal advantage may be obtained anywhere by walking up and down hill.

While good results are obtained by residence in mountainous regions, other conditions being equal, it is better to select localities with temperate climates, as of North Carolina and Colorado, in order that the patient may take as much out-door exercise as is compatible with his strength.

A location with some elevation and a dry and equable climate is better, generally speaking, than one having but little elevation, more moisture and greater changes. But persons easily excited, and prone to hemorrhages and febrile attacks do better at points near the sea level and where there is more moisture. Persons with weak or diseased hearts should not be sent to high altitudes.

If possible, it is preferable in all cases to have the

patient occupy a room, hut or tent alone. Two invalids should not be permitted to occupy the same apartment.

The modern plan of placing tuberculous patients in special sanatoria or hospitals is based upon the ideas which have been expressed and upon others equally important, of which the first is the separation of the sick from the well; the second, that the destruction of the bacillus can be more effectually accomplished; and third, that the sufferer can be more systematically fed and treated than in the average dwelling or in a general hospital. The plan has been successfully followed at Saranac Lake in the hospital under charge of Dr Edward J. Trudeau, for a number of years, and has been adopted in many other places in the United States, Germany, England and other countries, and will probably rapidly become general. There are already more than 30 such hospitals in the United States in full operation and several in process of construction. The United States Government has established a hospital at Fort Bayard in New Mexico for the treatment of tuberculosis among soldiers, and the official reports in regard to the results are singularly favorable, bearing out the general impression of the good influences of the climate of the region in which Fort Bayard is located. It does not appear from recent reports from various countries that the location of such hospitals, when properly constructed, if the air is free from impurities (the tubercle bacillus included), is a matter of consequence. A high and dry locality is to be preferred, but with proper regulations in regard to diet, cleanliness, dress, air and out-door exercise patients seem to do as well in one place as another.

While it is important that the patient should be required to take as much muscular exercise as his strength will permit, fatigue should be avoided.

Sleep is as important an element of the treatment as exercise. Patients, until they have regained strength, should spend from 8 to 10 hours of the 24 in sleep, or at least in bed. The advantages claimed for high localities are

in a measure balanced by the difficulty which many experience, especially those who are anemic and neurotic, in such localities in obtaining sleep. In the *Denver Medical News* (June, 1900), Dr J. T. Eskridge published an analysis of the relation of the climate of Colorado to sleep in the acclimated and in the unacclimated. In his summary he states that although people of regular habits have continuous and refreshing sleep, those or irregular habits sleep badly and are more depressed than at the sea level. "Slight disturbances affect the sleep to a greater degree than at sea levels. Less time is required to be devoted to sleep in Colorado (just why, Dr Eskridge does not inform us). In people who are mentally over-worked the sleep is broken and less refreshing and shorter than at lower altitudes. Persons of nervous tendencies do not sleep well unless they avoid excessive physical exercise. Neurasthenics are troubled with disturbed sleep unless they have an abundance of physical and mental rest, thus avoiding all things that disturb the mind and digestive organs. Tuberculous subjects sleep well if they avoid over-exercise and as their nutrition improves. The unacclimated tourist who exercises freely suffers from disturbed sleep. Among nervous subjects the unacclimated is especially irritable and his sleep disturbed. Unacclimated tuberculous subjects sleep worse unless precaution is taken to lessen the usual amount of exercise." In order to secure unbroken sleep the room should be well supplied with pure air. The temperature should be such as is agreeable to the patient. The bed should be a hair mattress, and the covering should be sufficient but neither too thick nor too thin.

Circumstances permitting, a tepid sponge-bath before retiring, which many tuberculous subjects avoid from the impression that they are more liable than other persons to take cold, greatly promotes comfort and the probability of sound sleep. The bath may be repeated at the hour of rising.

Strict attention should be given in every case to the

condition of the digestive organs, so frequently disordered in tuberculosis, and the diet should be nourishing, prepared in palatable shape and regulated in quality and quantity to suit existing conditions.

The clothing should be comfortable, neither too heavy nor too light. Changes should be made to suit variations in temperature, and a complete change should be made at night.

It is gratifying to note the rapid improvement in health which occurs under the course which has been described; when it fails the office of the physician becomes, as Voltaire wrote, "a melancholy attendance upon misery," too often aimless, and always hopeless.

CHAPTER IV - SURGERY

A Case of Acute Tuberculosis of the Peritoneum

By DUDLEY P. ALLEN, M. D., Cleveland

A single case of tuberculosis of the peritoneum would scarcely seem worth reporting, but the unusual character of the one which I am about to describe is so unique as to warrant a short report. The special points of interest in the case are the rapid development of the symptoms and the resemblance which the case bore to appendicitis. The young lady, 19 years of age, had ordinarily good health, although she was not robust. During the winter of 1901-2 she had been attending school. In the last of March she says that she had had some chilly sensations, afterwards had felt a little feverish and had had also a slight cough, but the symptoms were not of sufficient severity to keep her from her regular school work. On account of these symptoms she visited her physician, and he had examined her, but found nothing serious. No trouble of any kind was found in the lungs. The physician gave the patient a tonic, and after a few days she reported herself well, the cough having entirely ceased.

On April 15, 1902, at 9:30 a. m. the patient went to her classes. While in class she had a feeling of chilliness, but remained in class until 11:30. Her physician, Dr Jameson, of Oberlin, was called to see her at 3 p. m. She complained of some abdominal pain, which was general, but in the evening she referred this to the right iliac fossa. At this time the doctor telephoned to me and arranged to bring the patient to the hospital, a distance of thirty miles, the next morning.

At the time of admission to the hospital the patient's

temperature was 103° and the pulse was 120. Her illness was so grave that she was carried from the ambulance directly to the operating-room. On examining the abdomen it seemed slightly more distended than normal, and there was a little feeling of persistance over its lower portion. There was no perceptible change on percussion. The only tenderness, of which the patient complained on pressure, was in the region of the cecum. Unfortunately no blood-count was made. The symptoms and physical examination led to the conclusion that the case was one of acute appendicitis.

After preparing the patient for operation the abdomen was opened. The omentum presented in the wound, being much thickened and studded all over with yellowish nodules, suggesting miliary tuberculosis. There were also numbers of white bodies about the size of a hazel-nut loose in the abdominal cavity, having the appearance of very dense coagulated fibrin. These bodies were round and smooth. On examining the appendix it was found to be normal. On opening the abdomen more widely, masses resembling tuberculous material were found studded all over the intestines and the peritoneal surface of the abdominal wall. These extended upward to the upper portion of the abdominal cavity and downward into the pelvis. On examining the pelvis an adherent mass was found, and it was with some difficulty that the uterus was distinguished. The left tube and ovary were then separated from their adhesions, the ovary being cystic and the tube being about three-fourths of an inch in diameter and having in its center a small amount of cheesy-looking material. In endeavoring to reach the right ovary a mass was found filling the pelvis posteriorly to the right of the broad ligament. On attempting to shell out this mass it ruptured, and a considerable amount of yellowish purulent material escaped. The right tube was found to be distinct from this mass, and the conclusion was reached that the mass represented the right ovary. A most persistent attempt was made to shell this

from the peritoneal cavity, but the wall containing the pus had become so thin and friable that, beyond a small portion, it was impossible to separate it from the surrounding tissues. Therefore the only method to be observed was to drain the cavity. The whole of the abdomen was washed out with sterile water, the intestines being removed from the abdominal cavity in order to wash both them and the cavity with the greatest thoroughness. The abdominal cavity was filled with sterile salt-solution, and the cavity in the pelvis which contained the pus was packed by means of a Mikulicz tampon, a glass drainage-tube being carried down to the bottom of the cavity inside of the tampon. The abdomen was then closed except at the point of drainage.

My reason for detailing this case is on account of the extreme rarity of the symptoms presented, and the resemblance which they bore to appendicitis. My own experience would lead me to conclude that cases of tuberculosis of the peritoneal cavity are usually much slower in their development. That the disease should have given no marked evidence of its existence until less than 24 hours before operation, and that the symptoms should then develop so rapidly as to resemble a case of acute appendicitis is most unusual.

Another case has recently come under my observation which is of interest in this connection and may be detailed in a few words. The case is one in which I was called in consultation with Drs Green and Borts of Cleveland. The patient was a young man seventeen years of age, not especially robust, although he had been ordinarily well until a little less than two weeks before the time when I saw him. Previous to this, however, he had complained of becoming fatigued more easily than usual. When I saw him on March 25, 1902, he had been under the care of a physician for several days. His temperature had reached 101°, and he complained of general abdominal pain, a little more on the left than on the right side. There had been no special distention of the abdomen until two days before I saw him,

when there had been a silght dulness observed on percussion over the pubes. This did not disappear on passing urine. The abdomen was markedly distended, and there was an area of dulness just above the pubes presenting exactly the form of a distended bladder. This dulness reached half way to the umbilicus. On bimanual examination, with the finger in the rectum, this mass could be felt to be fluctuating. The pulse was rapid and of high tension, and the boy presented the appearance of being gravely ill. The diagnosis made by his physicians had been appendicitis, but I disagreed with them and said that I thought the case was one of acute tuberculosis of the peritoneum. The factors which led me to this conclusion were that the patient had not been feeling strong for some time, that he had suffered from pain for nearly two weeks, that this was more on the left than on the right side, and that the collection of fluid filling the pelvis had exactly the form of a distended bladder, and did not reach more to the right than to the left side. A white blood-count at this time showed 21,000 leukocytes to the c. m. Just before the operation the next morning it was 22,000.

On opening the abdomen floculent pus was evacuated, but it had the strong offensive odor which is often met with in abscesses resulting from appendicitis. On examining the region of the cecum I encountered adhesions presenting the same characteristics as those commonly found in an ordinary attack of appendicitis. After a fairly thorough search I failed to find the appendix, and as the pus was of a sort to make it quite possible that the appendix had been destroyed by the process of suppuration, and since the condition of the patient was so extremely grave I thought it unwise to search longer, since a prolongation of the operation might have led to a fatal termination of the case. I therefore washed the cavity and inserted a Mikulicz tampon to secure permanent drainage. The organism developed by cultures was the *bacillus mucosus capsulatus.*

This patient gained rapidly, the convalescence being uneventful, and the wound healed solidly in about four

weeks. The patient was dismissed from the hospital in excellent condition in a little over five weeks.

My object in describing the first case and citing the second is not to enable me to discuss at length the question of tubercular peritonitis, but simply to point out the fact that there may be great difficulty in diagnosticating certain cases. Everyone with a large experience in abdominal surgery must recognize the fact that diagnosis in these cases is beset with great difficulty at times, and that surprises must constantly arise. The occurrence of such surprises emphasizes the importance of the performance of operations under the most favorable surroundings, so that any unanticipated complications may be met in the most efficient manner.

The results following operations for tubercular peritonitis vary widely. Some cases are relieved but temporarily, while others remain in good health many years and seemingly are entirely cured.

The outcome in this case and in others similarly grave which have come under my care is sufficiently favorable to warrant the conclusion that cases of tubercular peritonitis, even though far advanced, should be operated upon. Some cases may be benefited but temporarily. Some of the cases upon which I have operated remain in good health at the present time, many years having elapsed since operation.

The Treatment of Suppurative Inflammation of the Kidneys

By Frank Warner, M. D., Columbus

Professor of Operative and Clinical Surgery, Starling Medical College

The causes of suppurative inflammation of the kidneys are so varied that the treatment which may be instituted for its relief is commensurate with its causes. Numerous as are the

causes of this disturbance, there is still a considerable sameness in the producing factor of all:

First, a plain catarrhal inflammation.

Second, an infection.

a. This infection, from within, conveyed through the blood.

b. From without, infection carried into the bladder through the urethra, perhaps by a catheter, which may have been none too clean.

The most frequent cause, of course, is the presence of a renal calculus. This source of irritation begets first a simple catarrhal inflammation, which sooner or later takes on the suppurative variety of inflammation. However, this is not true in all cases, especially in recent cases of renal calculus. In the older cases, there is an ulceration of tissue and a breaking down of some blood-vessels, as shown by the usual accompaniment of hematuria. Soon after this, if pus is not found in the urine, the case pursues an unusual course.

Pus in the urine, as a symptom, may mean a great many different things of course. It may mean an abscess in one or both kidneys, a pyelonephrosis, an interstitial nephritis, or the suppurative trouble may be confined to the pelvis of the kidney alone, a pyelitis; but a pyuria more frequently means that the pus comes from the bladder rather than from the kidneys, and this is a very fortunate circumstance indeed. Even though the pus is reasonably demonstrated to come from the kidneys, the patient, of course, may soon make a perfect recovery. A greater amount of hazard from an extensive involvment of the kidneys may ensue, even though the pelvis of the kidney alone be involved in this suppurative trouble in the beginning.

I have not found the settling of the question of the location of the diseased area which produces the suppuration in pyuria, the simple one that many of our text-books seem inclined to lead us to believe. It is true, if in the microscopic examination of the urine, we find associated with the pus an unusual number of large, flat, epithelial cells of the

bladder-wall, we may conclude at least that the bladder is involved in this suppurative inflammation, even though the ureter and kidneys are escaping. Should we infer that a purulent cystitis is that and nothing more, I am sure we should be led into frequent errors. If with our pyuria, we find the round-celled renal epithelium freely cast off, the likelihood of the disturbance being located in the pelvis of the kidney is very strong; or if associated with the pus the small spindle-cells of the kidney present themselves, and especially if accompanied by renal casts, the case is then not difficult to diagnose as one of interstitial nephritis. Without these casts, and having simply the small spindle-cells to guide us along with the presence of pus in the urine, we are still in the dark as to whether the trouble is in the kidney substance proper or whether the pus is yielded from some pathologic lesion in the ureter, for the appearance of the epithelial cells in the two regions present so many peculiarities alike, at least, so much so as to confuse any but the most expert in microscopic manipulation.

So many times in an examination of urine containing pus, epithelial cells from every part of the urinary tract are found, and found not in excessive numbers the one kind over the other so as to indicate the source of the chief disturbance.

This would suggest to us then the importance of not relying unduly on the microscope for our diagnosis of these suppurative disturbances of the urinary tract. While of the greatest aid in helping us to formulate a conclusion if associated with the symptoms that pus formation has given rise to, without the clinical history we are going to fall far short of arriving at the truth if we fail to combine in each case laboratory results with case history.

Take for instance one line of causes of suppurative inflammation involving a considerable area of the urinary tract, hypertrophied prostate or strictured urethra. Sooner or later we have an infected bladder. From the purulent cystitis there may result an ascending inflammation taking in the pelvis of the kidney or even still higher into the kidney

substance itself, forming a pyelonephrosis or a suppurative pyelonephritis. Falling short of the interstitial nephritis, we could certainly do nothing better to relieve the pyelitis than to relieve the strictured urethra or to overcome some of the cystitis due to the hypertrophied prostate, by frequent but carefully administered aseptic irrigations of the bladder and the regular catheterization of the bladder with a clean instrument. We must recall that one of the most frequent ways of producing a pyelitis or an interstitial nephritis is by a dirty catheter. It is difficult to persuade some of the laity of this proposition, yet every physician, after he has been in practice a few years, encounters such cases, but if hypertrophied prostate that is complicated with pyuria is handled with reasonable skill along the lines indicated, we shall soon see not only the bladder symptoms mitigating but the ascending pyelitis will soon diminish or perhaps disappear, providing, of course, destructive changes have not already occurred in the kidneys. This, however, we cannot foretell without tentative trial. By this treatment we will have accomplished a twofold purpose; in the first place the bladder irritability will have been lessened and the chances of still further ascending pyelitis diminished. In the second place, we will have demonstrated whether the possibility still exists of benefiting the patient by one of the more radical operations for the relief of the symptoms due to an hypertrophied prostate. If we cannot secure a material diminution of the pyuria by irrigation and catheterization, we will not accomplish good by a radical operation upon the prostate. If the case is of long standing and the infected area is not greatly benefited by the means just stated, the presumption is that the kidneys are involved in a pyelonephrosis that will not yield or even be favorably influenced by an operation upon the prostate, however much good the operation may have done in the first place.

At the same time that we are making this local treatment to the bladder, from which our ascending pyelitis developed, we shall have accomplished some good by rendering the

urinary tract as sterile as possible, by the administering of some such therapeutic agents as salol, benzoate of soda, etc., and the free drinking of water to douche out the urinary tract.

To illustrate the development of a case of pyuria by direct infection there comes to call one of a typical class following typhoid fever, or which may follow any of the infective fevers. A male, aged 50, had typhoid fever. At the end of six weeks, when all seemed to be progressing well toward convalescence, the patient developed irregular chills, followed by sharp rises of temperature. There was very little to attract the attention in the direction of the kidneys. It is true, there was some slight pain in the back, but hardly of a kind or degree to suggest the kidneys as a cause; but in making a systematic inquiry as to the various secretions, the information was elicited that the quantity of urine was decidedly increased; that the patient urinated not only several times in the course of the night, but a considerable quantity at each urination. This, of course, at once suggested the idea of an examination of the urine. The very faintest traces of albumin were found, but the sediment gave greater information. The microscope revealed pus in the urine. It not only revealed the presence of pus but the exfoliation of characteristic round-celled epithelium such as line the pelvis of the kidney. There were present not more than the normal number of bladder epithelial cells. As there were no bladder symptoms, as vesical tenesmus, no exfoliation of bladder epithelium, but there was present the characteristic renal symptom of a pyelitis such as frequently follow the infective fevers, the diagnosis was regarded as made. The urinary tract was kept in as aseptic a condition as was possible to make it by the administration of salol. Large draughts of water were encouraged in order that the kidneys might be daily flushed to carry away the debris. Indeed, it seems a provision of nature that the polyuria which is associated with the pyelitis is an effort of the kidneys to free themselves of the accumulating pus and inflammatory debris.

Despite the ease with which we located the place from which the pus came in this case of pyuria, sometimes I have not found it so simple a matter by any means.

Morrow makes the suggestion of washing out the bladder and collecting a sample of urine within 10 or 15 minutes after the washing. He argues that if the pus comes from the kidneys you will get it in this way; if from the bladder, the thorough irrigation will have washed the pus so completely away as to give a urine free from pus for the time being. Personally, I prefer to leave the catheter in after the irrigation and collect the sample in that way. I believe the chances of error are much less when this custom is followed.

With a calculus in the kidney, the element of pain is usually such a factor in aiding in making our diagnosis, that the presence of pus in the urine is only a confirmatory symptom; yet I have seen all the symptoms of renal calculus present, with a pyelitis, and yet all symptoms subside.

For instance here is a case that presented all symptoms of renal calculus of the right kidney. There was an intermittent hematuria, intense pain at times over the right kidney, radiating down the ureter; the pain was aggravated by motion; there was occasional vesical tenesmus; and there was pus in the urine. It was demonstrated that this pus did not come from the bladder, but by the separator it was shown to have come from the right kidney. The patient was greatly run down preceding the disturbance of the kidney.

Rest in bed and a tonic treatment brought about a complete subsidence of all symptoms and the trouble disappeared. The trouble was evidently a simple suppurative inflammation involving the pelvis of the right kidney. This condition had been made more possible by the preceding ill health. The correction of the ill health had rendered it more probable of getting rid of the pyelitis before there was extension of the suppurative inflammation into the kidney itself. The high grade of pain in this case was evidently due to the inflammatory disturbance present. Such a high grade of pain in a simple pyelitis is quite contrary to my experience, denoting

the presence of a calculus, or as I have sometimes seen, oxalic acid crystals produce this pain during their passage down the ureter.

It seems to me that this case should suggest to us the fact that inasmuch as in all cases of pyelitis the health is greatly impaired, a tonic, reconstructive course of treatment should not be lost sight of while attempting to render the urinary tract as sterile as possible.

The symptoms that characterize a pyelitis due to tuberculosis of the kidney and that are the result of a renal calculus have not always been distinctive in my cases. It is true that the element of pain is usually greater with stone, but the vesical intolerance, the fever, the emaciation, the polyuria may be very similar in the two cases.

Purdy thinks that blood is found in the urine at an earlier period with stone than in tuberculosis of the kidney. This has not been a distinction that has guided me in a differentiation of the two troubles. The X-ray is valuable as a point of differentiation in some cases, but the X-ray does not show all forms of calculi. The emaciation, as a rule, is greater in tubercular cases, especially at an early stage, but after a prolonged suppurative disturbance about the kidneys, the eventuating hectic, resulting from whatever cause, may, and does, lead to an emaciation that makes the latter symptom one of doubtful utility.

When a suppurative disturbance has continued so long as this, operative treatment has come to be imperatively demanded. If a stone is found, remove it. If a tubercular mass is found and confined to the seat of its usual place of earliest implantation, near the pelvis of the kidney, break the mass down and treat it by drainage through a lumbar incision. If the kidney seems so extensively involved as to render the cure from a mere nephrotomy ineffective, then we had better run no further chances by prolonging the destructive disturbance, but at once resort to a nephrectomy, provided of course, that we have previously satisfied ourselves that the

trouble is confined to the one side, and that two kidneys are in existence.

If in the course of the operation we have located a pyelonephrosis, and we are content to treat the disturbance by drainage alone, we should satisfy ourselves that the ureter does not contain a calculus which has been the original cause of the trouble in the kidney.

To attempt to discuss all phases of the treatment of suppurative inflammation of the kidneys would be quite out of the limits of a paper of this character, but I am convinced in having examined many specimens of urine in cases of slight alteration of the normal urinary flow, that there are quite a few of these which are the result of a very *mild* grade of pyelitis; that many of these are promptly cured by timely administration of urinary antiseptics, especially if these are backed by a judicious tonic course of treatment.

Report of Cases of Surgery of the Thyroid Body

By John Chadwick Oliver, M. D., Cincinnati

Diseases of the thyroid body calling for surgical intervention are by no means common in this locality, nor does there seem to be any portion of the United States in which goiter is an endemic condition. Certain parts of England (Derbyshire) and of Switzerland (Cantons of Berne and Fribourg) seem to possess the conditions most favorable to the production of this disease. Careful investigation of the local conditions fails to reveal any clear and distinct cause for this unusual prevalence of the disease.

Berry (Diseases of the Thyroid Gland, page 71) says, "Summing up, there can be no doubt that climatic and atmospheric conditions have little or no share in the causation of goiter. That want of air and sunshine has absolutely nothing whatever to do with it is equally certain. Habits, such as carrying weights on the head, violent exercise and

the like, play but a secondary part in the production of the disease. That heredity is the cause of goiter is extremely doubtful. Intermarriage has certainly no share in its causation."

"That there exists some definite relation between endemic goiter and some poison in the soil upon which it is found is tolerably clear, and there can be no doubt that in the vast majority of cases drinking-water is the vehicle by means of which that poison obtains access to the body. Such water is usually, if not always, derived from calcareous soils, but it is probable that the goiter-produced poison is not a salt of lime or magnesia. It has not yet been proved satisfactorily that any salt of iron is the essential constituent. The same may be said of microorganisms.

What little personal observations I have been able to make convince me that in this country at least, locality, social station, heredity and age are not important factors in the etiology of the disease.

From a surgical standpoint the chronic affections of the thyroid calling for possible surgical intervention are four—parenchymatous goiter, cysts, exophthalmic goiter and malignant diseases of the thyroid. I have had no personal experience in the surgical treatment of the exophthalmic variety. The cases reported below have some points of unusual interest and are therefore worthy of being placed upon record.

Case I: Eva S., aged 12, had been afflicted with an enlargement of the right side of the thyroid body for seven years. She was referred to me by Dr Robe, of Peebles.

The superior thyroid artery passed in an oblique manner from above, downward and inward over the mass. Palpation of the enlargement conveyed the impression that the growth was cystic. A curved incision was made, beginning in the median line, going down to the upper part of the sternum, then curving to the right and up to the top of the tumor. The muscles were divided and turned back. The

cystic character of the growth was now very apparent. Further investigation disclosed the fact that there was but one large cyst. This was rapidly enucleated after the superior thyroid artery had been tied. Ligature of this vessel was necessary in order to prepare a safe approach to the gland. After enucleation the tissue of the thyroid was brought together by sutures (catgut). The muscles were sutured and the external wound closed tightly with a subcuticular silkworm-gut suture.

This patient had an enlarged heart with an inconstant murmur, but there was no exophthalmos. Union took place by primary intention, and the patient returned to her home much improved in appearance. There were no unpleasant complications in this case beyond a pretty smart hemorrhage during the enucleation of the cyst.

Case II: Mrs. P. was a fleshy, short, thick-necked woman, aged 28, with an enlargement of the left lobe of the thyroid gland extending from the sternum to the angle of the jaw. This had been present for ten years. The patient attributed the condition to an attack of scarlet fever she had had shortly before this. She had been treated for three months by an osteopath, who had religiously rubbed her neck each day. The growth seemed to grow away from the trachea and there were no symptoms of pressure upon that viscus, although her voice had become somewhat strident. She complained more of the deformity than of the pressure. She had no exophthalmos or irregular heart action. Her general condition was excellent. The dangers of operation were fully explained to her, but this did not deter her from desiring its removal. In this case the bulk of the tumor seemed to be cystic.

She was operated upon March 1, 1902, at Christ's Hospital. An incision was made reaching from the angle of the jaw down along the inner edge of the sternomastoid muscle, curving at the base of the neck so as to reach the median line just above the sternum. It was then continued along the median line for an inch and a half. When the capsule proper of the gland was reached a knife was plunged into the organ and exit given to several ounces of

blood-stained, grumous fluid. This did not materially diminish the size of the mass and the finger introduced into the cavity showed a very considerable mass of thyroid tissue present. In view of this an excision of the lateral half of the thyroid was made. The wound was sutured tightly with a subcuticular suture of silkworm-gut. The patient sat up on the second day and went home on the ninth, the stitch being removed on the sixth day.

Case III: Miss S. R., aged 43, had noticed an enlargement on the right side of her neck for 18 years. She was not absolutely sure but that it might have been there longer. During this period the patient had tried iodin, arsenic, thyroid tablets and all medical suggestions coming from any source, but absolutely without benefit to the condition. She consulted me with the idea of having the mass removed. In this case there were slight pressure symptoms, but, as in the previous case, the main complaint was of the deformity. She was fully enlightened as to the character and seriousness of the operation. She chose to run those risks in order to be rid of the deformity.

On September 28, 1901, a crescentic incision, with the concavity upward, was made over the mass. After the infrahyoid muscles had been divided a search was made for the superior thyroid artery in its usual locality. It was not found at the outer upper angle, but was very unexpectedly ruptured at the inner upper angle. Investigation showed that the superior thyroid artery came from the left carotid, passed across the trachea and entered the gland in the situation mentioned above. The superior thyroid vein was tied separately. The capsule of the gland was readily reached by blunt dissection. It was now seen that the goiter was composed of two masses, one on top of the other. In attempting to isolate the upper mass the inferior thyroid artery was ruptured at the inner lower angle of the gland. All visible venous channels were ligated and the upper of the two masses was thus liberated. As the finger was carried around the mass another artery was ruptured deep down near the outer lower portion of the mass. This vessel could not be picked up readily so pressure was used for its

temporary control. When the mass could be brought up into the wound it became apparent that the anterior mass was the left lobe of the thyroid displaced to the right of the trachea. This explained the curious distribution of the arteries. The isthmus, instead of running across in front of the trachea, ran anteroposteriorly from the superimposed left half of the thyroid to the subjacent right half. The isthmus was now divided and the left half of the gland removed. We had already ruptured the inferior thyroid artery going to the remaining right half of the gland but had not as yet secured the vessel. The bulk of the right half seriously interfered with the clamping of this vessel. It now developed that the remaining right half of the gland was cystic and evacuation of the contents of this cyst permitted the ready control of the inferior thyroid artery. The interior of the cyst was curetted and the remaining portion of thyroid tissue whipped together with catgut sutures.

The operation was an exceedingly severe one and the loss of blood was very great, yet the patient rallied quickly from the shock and made a very excellent recovery.

This case is, I believe, unique, in that both lobes of the thyroid gland were on one side of the neck. A personal correspondence with Mr Berry corroborates the above statement so far as his investigation goes. This was one of the most embarrassing operations it is possible to imagine because of the fact that the blood-vessels were apparently all misplaced. One could not by any known means have suspected the condition that was found, and hence the troubles described above arose in the course of the operation.

Case IV: Mr W., aged 44, was referred to me by Dr J. M. Withrow because of extreme dyspnea associated with an enlarged thyroid. When first seen by me the patient was scarcely able to breathe. Each breath gave rise to a high-pitched tubular sound, indicating extreme pressure upon the trachea. The history of the case and the physical character of the growth made it apparent that we were dealing with a malignant growth of the thyroid. In view of

the man's desperate condition it seemed permissible to make an effort to relieve the pressure, which object might be accomplished by removal of the malignant growth.

With this object in view the patient was given chloroform, which he took quietly for about a minute and then suddenly raised up upon the operating-table gasping and fighting for breath. All attempts to restrain him were futile because of the hunger for air that he experienced. He was fighting desperately for life. During this time an attempt was made to force his jaws open in order to insert a tube into the air-passages. The rigidity of his muscles was such as to render this attempt futile. In view of the apparent imminence of dissolution a hasty incision was made in the median line, the tumor mass was cut through, and the trachea opened. This gave him relief from the dyspnea. The tumor mass was rapidly scooped out with a sharp spoon through lateral incisions made for this purpose. Hemorrhage was very free but was finally checked by means of pressure-forceps and hot gauze packing. The patient was returned to bed in very good condition. His breathing was much improved and he expressed himself as feeling very much more comfortable.

The following morning he was seized with a severe attack of dyspnea in spite of the fact that a long tracheotomy tube was in position. This attack was relieved by removing the tracheotomy tube and inserting a large-sized hard-rubber catheter deep down into his trachea. This was left in position, and the patient again became quite comfortable. The patient died very suddenly the following day. He had no further attacks of dyspnea and seemed to be doing very well up to the minute of death.

Postmortem examination failed to reveal the cause of this sudden death. The catheter had passed beyond the constricted portion of the trachea and seemed to be sufficient for purposes of respiration. Marked flattening of the trachea corresponding to the position of the growth was discovered at the autopsy. Microscopic examination of the growth proved it to be carcinomatous.

These four cases represent the conditions that will ordinarily be found in operations upon the thyroid. The first case may possibly have been one of the exophthalmic variety, although protrusion of the eyes was absent. It represents the cystic variety of goiter. The second was an example of parenchymatous goiter. The third is the most interesting of the cases because of the peculiar anomaly present. The fourth represents malignant disease affecting the thyroid body, a class of cases not amenable to surgical treatment.

There is probably no region of the body which requires such care and cautiousness in operative measures as does the thyroid. While some of the cases of cystic goiter are easily rectified, the majority of all these cases are very difficult ones for operation.

DISCUSSION

Dr J. B. Alcorn, Gallipolis: There is one question that I would like to ask the author of the paper which has been read. He makes the statement that heredity has very little to do with the etiology of the disease of goiter. If he should have brought to him two cases of children in one family, affected with goiter, and these children favored the parent affected with the same disease; and also in another family two cases of goiter in children that favored the parent affected with the disease, would he consider that heredity had anything to do with the disease manifested in the children, and select that particular parent as being a casual factor in the production of the disease?

Dr Dudley P. Allen, Cleveland: Although the disease is of comparative rarity in Ohio, the subject is one of great interest. Years ago I operated upon a few cases of goiter, and became so much interested in them that when abroad I went to Bern to see Kocher perform this operation. In the large number of operations which he reports the results have been remarkable. In his clinic every morning one could see from one to three operations for goiter. He has a procedure which seems to be of value in these cases, to which Dr Oliver has referred, using cocain as a local anesthetic instead of general anesthesia. I was surprised to see how well the patients endured these operations. A 2%

cocain solution was injected along the line where the incision was made. This is sufficient to control almost entirely all pain during the operation. I have used this method repeatedly, and the chief thing of which the patients complain is pressure. They say, "Do not press so hard upon my neck." Pain is rarely spoken of. In the use of this method one avoids the dangers of a general anesthetic, which is one of the greatest dangers in certain cases of goiter. Extensive operations may thus be conducted satisfactorily and safely.

Dr D. S. Hanson, Cleveland: My experience with this disease has been such as to cause me to regard it as much more common than the author of the paper seems to consider it. I think in the early stages there are a great many cases neglected which should be treated. I know that I have records of some 12 or 15 cases which I have entirely cured by the internal administration of iodin and iodid of potassium and the local application of muriate of ammonia. The iodin and iodid of potassium was continued for about three months and then discontiued for two or three weeks. It was then followed up again for one or two months. This treatment is of great benefit in the early stages before cystic degeneration or other chronic changes take place.

Dr W. J. Means, Columbus: I have not had a very wide experience in operating on goiter. Of the cases that I have operated upon, one died. The case was an interesting one, in that there was a tubercular condition of the gland with calcareous degeneration. A sinus from the gland opening near the middle portion of the left clavicle had been discharging for several years.

The operation was carried out in the usual way. There was very little hemorrhage, and the patient seemed to bear the anesthetic very well. Asphyxia came on suddenly and resisted all the known methods to overcome it. I looked upon hemorrhages as one of the difficult complications to meet. The ordinary methods of pressure adopted in other locations cannot be successfully used owing to the interference with breathing. In a few cases hemorrhage did not interfere with the operation. The vascularity depends very largely upon the character of the growth. If the enlargement is hard and fibroid in character, the vascularity is not so great.

It has been my experience, however, that in the softer varieties hemorrhage is an important factor in the operation.

Dr Martin Stamm, Fremont: In regard to anesthetics in operating upon cases of goiter, I think those who have seen Kocher operate would realize how superior local anesthesia is to general anesthesia, and they would never use chloroform or ether again in these cases. I have seen him operate on 37 cases, and the only complaint the patients made was that of pressure, and this generally occurred at the moment when the tumor was being pealed out or raised up. This is the general experience of operators, otherwise the operation passes off without complaint. I had a case of goiter last summer, in fact there were two goiters, one on each side. I removed one under local anesthesia, and then asked the patient if I should remove the other. She said, "I don't care." I did not wait, but removed it at once and she did not make any complaint. I think chloroform is a very dangerous agent in goiter. Another advantage we have in local anesthesia is the fact that the patient can materially assist you during the operation, especially when you come in the neighborhood of the recurrent nerve.

Dr John North, Toledo: As far as the hereditary tendency to goiter is concerned, I do not believe that we have in goiter, as we have in other diseases, the direct transmission of the affection from parent to child, but I do believe that a tendency towards it is inherited. The disease itself is not directly transmitted. We are in the dark as to the causation of the disease. It has been supposed that water had something to do with it, that is, water in which there is a great deal of lime, but it seems that the disease is found in localities where there is no lime in the water as well as where it is found in the water, so it would seem that lime does not play any factor in the causation of the disease. Various other causes have from time to time been brought to our attention, but so far the etiology of the disease is very obscure.

I have been experimenting with a vegetable agent which will dissolve cocain which I think will be of material benefit when we wish to use cocain injections for operations.

Dr J. C. Oliver, Cincinnati, closing: In answering the first speaker I would say that there are many features connected with this question which would have as much, if not more, influence than the role played by heredity. Indications in general point to the fact that environment is of much more importance than heredity in the causation of the dis-

ease. If the question of environment could be ruled out of these cases, that is, if the mother of the children came from a locality in which goiter prevailed, and if brought up in an entirely different environment the possibility of heredity might be considered, but the most of these goiters are certainly acquired and not congenital.

The remarks of Dr Allen in regard to the use of local anesthesia in these operations meet with my most hearty approval. What little experience I have had in the use of local anesthetics leads me to believe that the efficiency of local anesthesia is very largely determined by the amount of endurance in the patient. I have seen statements made that the radical operation for hernia can be painlessly made with weak solutions of cocain injected into the field of operation. I have tried it, and seen others try it, and I have yet to see the patient who did not complain of pain. I recall seeing an operation last year for the radical cure of hernia in Johns Hopkins Hospital, which was afterwards referred to as a painless case. Unless my eyes and ears deceived me very much, the patient suffered very considerably from pain, so much so that he required the constant care of an attendant to keep his mind diverted from himself, and even then there were very serious complaints of pain. I have had some experience myself, and have also observed the experiences of others, and these lead me to have my doubts as to the efficiency of cocain when used in the ordinary way to relieve pain in these cases.

I think Dr Allen made an excellent point when he said that the only complaint patients made was that of pressure. Now when we anesthetize our patients and operate under general anesthesia pressure is not complained of as it is under local anesthesia, and we may sometimes make too great a pressure. Hence it is necessary for us to watch ourselves very carefully that we do not exert undue pressure.

I still adhere to my original statement, *viz.*, that the operation for goiter is not an easy operation. One of the previous speakers has referred to it as a simple operation. The operation for cystic goiter may be a very easy one at the start, but before you get through it may become exceedingly difficult. Hence I do not think that the doctrine ought to be promulgated that the operation for goiter is an easy one.

Surgery of the Thyroid Gland, with Lantern Illustrations

ABSTRACT

At the meeting of the Ohio State Medical Society, at Toledo, on May 27th, 28th and 29th, Dr B. Merrill Ricketts, of Cincinnati, after reviewing the Human and Comparative anatomy (miscroscopic and topographic) said that many assigned causes for abnormities of the thyroid gland were given, the most common being heredity, acute infectious diseases, and malignant neoplasms. All vertebrates were subject to the same laws concerning disease and abnormities of the thyroid gland. Nephritis from any cause was a common cause of them, and when it was a cause the growth was of rapid development. Thyroiditis was rare and, when present, followed an operation, or injury. Of the parasites, echinococcus and cysticercus were rare causes, while the bacilli of pneumonia, typhoid, and tuberculosis, and microorganisms of a selective type, were more frequent.

The results of disease of the thyroid gland were insanity, infection, hemorrhage, dyspnea, and rupture. Death might be due to any or all of these causes.

The thyroid gland was subject to nearly all forms of benign and malignant neoplasms. Their treatment he classified as: 1. Medicative. 2. Operative. Medicative treatment was of but little avail, except to palliate. Extracts benefited, but did not cure. They lessened the size of the neoplasm. Only commendable in a certain class of cases as a palliative measure, other remedies were useless. Fresh glands on ice did not produce toxic effects, and the best results were observed in chlorotic patients when raw sheep's-gland was used.

Operative treatment: Dyspnea, stridor, rapid growth, dysphagia, deformity, exophthalmic goiter, malignancy and emaciation, one or all, he said, indicated operation. Removal of all or a part of the gland should be given the

preference to the injection of iodin, zinc, iodoform, alcohol, or any other solution. Excision was more radical, safer, and required less time for recovery. Then, too, none of the neoplasm remained to be the seat of new growth, malignant or benign. All forms of new growth of the thyroid gland should be removed. Even in cases of exophthalmic goiter it should be operated on. All operative experience led to this conclusion. Great relief had been given in exophthalmic goiter.

Method: If the disease was confined to one of the two lobes without the isthmus, the diseased lobe might be completely removed, without much likelihood of recurrence of the growth. If an isthmus was present the other gland might become involved. It was probable that the disease being confined to one lobe might be due to the absence of the isthmus. So far as possible, the presence or absence of the second lobe should be determined at the time of operation. If the second lobe could not be found, the entire diseased lobe should not be removed, unless malignant.

The probabilities were that one or more supernumerary lobes were more frequently present in persons possessing but one normal lobe, no matter where the abnormal ones might be located. Supernumerary glands were more frequent upon the left side. The presence of supernumerary lobes might account for the absence of ill effects in those persons who had been subjected to the removal of an entire right or left gland.

Division of the capsule would permit of a thyroid gland being enucleated with ease and with the loss of but little blood.

The rapid pulse following removal of a thyroid gland was probably due to the rapid absorption of the thyroidin in the process of repair. The pulse would sometimes become much more rapid for from 48 to 100 hours, reaching at times 160 per minute, but it would at the end of this time subside to 80 or 90. If there was any pathologic tissue that

should be excised, it was that of the thyroid gland. In none of the major operations was the mortality less.

The author mentions six operations for various forms of pathologic thyroid gland with recovery in each case. Fifty lantern slides were shown to illustrate the anatomy, anomalies, kinds of growths (malignant and benign), parasites (animal and vegetable), bacilli and effects upon the trachea from pressure of thyroid neoplasms.

Some Observations on Appendicitis Based on 372 Operations

By George W. Crile, M. D., Cleveland

STATISTICAL SUMMARY.

Total number of operations.....372
Males ..... 61 %
Females ..... 39 %
Average age of males..... 25+years
Average age of females..... 26—years.
Number of deaths..... 21
Of the 21 fatal cases there were:
Males 15
Females 6
Average age of fatal male cases..... 26—years.
Average age of fatal female cases..... 15+years.
As to the period of operation there were:
(a) Interval and chronic cases..... 120
(b) Acute, while the infection was limited to the appendix. 64
(c) Acute, after the infection had extended beyond the appendix 188
Mortality rate:
For 372 cases.....5-6 %
Interval and chronic cases..... 0 %
Acute while infection was limited to the appendix..... 0 %
Acute cases after the infection had passed beyond the appendix ..... 11 + %
Interval and chronic cases.....120 operations, 0%
Acute cases .....252 operations, 8%
To illustrate the discussion they may be divided into the following two classes:
(a) Interval and chronic cases, and those acute cases in which the infection was still limited to the appendix 184 0%
(b) Acute cases in which the infection has passed beyond the appendix .....188 11 + %

These tables show a proportion of males to females of about 3 to 2. The average age of the females is slightly higher than that of the males. Of the fatal cases, the number of males is disproportionately large. The average of the fatal cases in the female is lower than that of the males; but the number of cases is too small to be of much statistical value.

In the mortality table the contrast between the cases operated on in the interval, in the chronic stage while the infection was still limited to the appendix, and the cases in which the infection had passed beyond the appendix, is marked. In the former there were 184 operations without a death; in the latter 188 with 21 deaths. Of the former, none were at any time in danger. The average time of confinement in bed was about two weeks. In every instance the recovery from the operation was easy, and the patients resumed their usual vocation early. In none did hernia develop.

In the second group there were 188 operations with the following results: There were 21 deaths, or 11%; the convalescence was in most cases prolonged, in one case 26 weeks; many of the patients became extremely septic. In more than one-fourth of the drainage cases hernia at the site of the old scar appeared within the first year following the operation. In severer cases toxemias were marked long after the patient recovered from the operation.

In some cases the outcome as to life was doubtful for weeks, and even for months. Among the complications were two perforations of the bladder, the pus discharging through the urethra. In three cases there was a suppurative cholangitis; one recovered after 11 weeks of critical illness, and two died, the autopsy showing multiple abscess. In four cases the infection passed into the retroperitoneal glands, necessitating posterior incision and drainage. In a case seen with Dr C. F. Cushing of Elyria, in which the walling-off process was imperfect, an abscess developed in the pelvis extending up the left iliac fossa. This was

opened by a left lateral incision. A fecal fistula appeared soon after. Later a large colon-bacillus abscess developed in the right pleural cavity, following which another developed in the left pleural cavity. At this time there was a bilateral fecal fistula and a bilateral empyema. A rib was resected on each side, and free drainage established. At this stage there developed a severe acute nephritis. The pulse ranged from 170 to 180 to the minute and there was vomiting. The entire illness lasted six months. At present, 16 months after the operation, there is still some albumin in the urine.

In another case, at the time the patient was presented for operation, the abscess extended upward behind the peritoneum displacing the liver toward the median line, and passed through the diaphragm into the pleural cavity. An incision was made into the abscess in the right iliac fossa, another just below the diaphragm. On resecting the fifth rib a large amount of pus gushed out. A tube entering the fifth intercostal space and emerging from the opening at the iliac fossa provided efficient drainage. After 12 weeks his convalescence was completed.

Another case presented multiple abscesses occupying both loins and the lower half of the abdomen. Through a median incision the abscess cavities were converted into a single one and the pus thoroughly washed out. About 10 days later a new abscess formed which perforated into the bladder and was finally discharged through the urethra. The patient recovered after 18 weeks' illness. In another case the abscess was retroperitoneal extending downward precisely as a psoas abscess underneath Poupart's ligament and the fascia lata presenting at the popliteal space; upward it extended to the diaphragm becoming suphrenic, displacing the liver inward, extending through the diaphragm into the pleural cavity. It also surrounded the right kidney. The abscess cavity extended from the sixth intercostal space, the point of the upper opening, through the diaphragm, between the liver and the kidney along the psoas

muscle, under Poupart's ligament and the fascia lata presenting at the popliteal space. At the time of operation there was a large bulging at the popliteal space, and the skin had become red, indicating impending perforation. After 18 weeks, all the sinuses had healed.

As to the fatal cases most were of sudden onset, quickly followed by diffuse peritoneal infection, with but little or no localization. Those in which an autopsy was made showed a general infection, the route of invasion being mainly along the iliac fossas, the diaphragmatic peritoneum being involved in all. Four of the fatal cases were due to a distinct septicemia. These cases presented certain characteristics in common, *viz.* there was a chill early in the disease in each, in two there were repeated chills; the onset was slow; the toxemia as indicated by the increase in pulse rate, increase in temperature, etc., was marked. The abdominal symptoms were not prominent; in one there was pus in the appendix, in another there was a small walled-off abscess; in another there was a gangrenous mucosa; and in still another the evidence of the infection of the appendix was microscopic. In none was there any abdominal pain of importance after the operation; in but one was the abdomen distended, and in this instance it was but slight; in two the abdomen was scaphoid; in none did abdominal tenderness develop after the operation. All were characterized by their freedom from pain; all became delirious early. In two there was marked mental excitation; in two stupor, the former closely resembled fatal iodoform poisoning, but in none was iodoform used. In none did the operation even temporarily modify the course of the disease. In these cases the infection probably reached the circulation and they became pure septicemias. Given a distinct diagnosis of appendicitis, if the constitutional symptoms develop rapidly while the abdominal remain stationary or diminish, the prognosis is unfavorable.

The results of operations in the quiescent period and in the beginning of the acute period contrast strikingly with

those performed after the infection had passed beyond the appendix. In the one group of 184 operations without a death, there was but little suffering, a short convalescence, and no complications; in the other of 188 operations there were 21 deaths, associated with much suffering, a prolonged convalescence and numerous complications. It seems clear that every case of appendicitis falling within the former group should be operated on. For the latter, no rule can at present be applied.

Further experience confirms the opinion expressed in a previous paper that in this class of cases a house operation is preferable to moving the patient to a hospital. The statement of Richardson that there may be a time in acute cases too late for the early operation and too early for the late operation has been several times strikingly illustrated. In cases in which for any reason operation is not performed what is the best plan of management?

Give the gastrointestinal tract absolute rest. After the diagnosis is established, and if operative treatment is not to be considered, sufficient morphin may be given to control the pain. *All nourishment and drink should be given per rectum. Cathartics are apt to do much harm.* Vomiting is best controled by gastric lavage. My own experience confirms the well-known views of Ochsner in the plan of non-operative treatment.

Supported by these statistics, which fairly represent the present surgical status, is it not assuming an unwarranted risk in waiting to see whether a given case will become so severe as to require operation? When the symptoms positively indicate such condition, the time for a safe operation is past. The course of safety lies not in waiting to find out whether a given attack will be grave or light but by prompt operation. There is abundance of evidence to show that the first attack may be fatal and that the case having but a single attack is a rare exception. There is then no justifiable reason for delay in even the first attack. Neither is there any reason for not advising an interval operation after the first attack;

nor for not advising operation on the appearance of the first symptom of the second attack.

DISCUSSION

Dr J. F. Baldwin, Columbus: There is only one point on which I would like to speak, and that is in reference to the location of the pain in appendicitis. The location of the pain is not by any means always in the region of the appendix. At the outset the patient usually complains of pain in the pit of the stomach, and both he and his physician, unless the latter is on his guard, will be likely to regard the case as one of colic, until a few hours later the symptoms point more decidedly to the region of the appendix. Sometimes, however, the pain continues to be manifested at a point quite remote from the appendix. This fact has been impressed upon me by several cases which have come under my notice during the last year, notably by one which I saw only two months ago. This patient said that all of his pain had been in the left epigastrium, over which region poultices had been applied continually. He had had several attacks of appendicitis, but it was only during his last attack that he complained of any pain in the right side of the abdomen, and this pain he located midway between the crest of the ileum and the last rib. It was this location of the pain during his last attack which led to the suspicion that all his trouble was due to recurring appendicitis. When he came to consult me, examination at the point where he had last noticed the pain enabled me to feel what I thought was the thickened appendix. I opened the abdomen at this point and found the appendix as expected; it was thickened, imbedded in adhesions, and contained some pus. The operation was a difficult one, but the patient made a complete recovery.

In two other cases which I have had both of the patients complained of pain on the left side, and had no pain in the region of the appendix, although examination showed that this was the point of chief tenderness.

This peculiar failure of the nerves to locate the pain may exist even after the appendix has been removed. I saw a case about a year ago in which there had been complete obstruction of the bowels for one week. The patient was moribund when I saw him. He had complained throughout of pain in the region of the spleen, and here hot

water bottles and poultices had been freely applied. His appendix had been removed by another surgeon three years before, and a hernal protrusion existed at the site of the operation, which was in the usual place. My diagnosis of the case was that the obstruction was due to a band of adhesions, probably resulting from his previous appendicitis. He died about two hours after I saw him, and the autopsy, which was made next day, showed everything within the abdomen entirely normal, except that about a foot of the small intestine, which had been tightly caught under a band of adhesions resulting from an old appendicitis, was entirely gangrenous. There was no trouble whatever in the region of the spleen where the pain had been located. It was this mislocation of the pain that had thrown his attending physicians off their guard. If the pain had been in the region of the appendix they would have suspected the trouble, and a correct diagnosis would have saved his life by an early operation.

Dr Thad. A. Reamy, Cincinnati: I would like to ask Dr Crile if I understood him correctly, to say that he would operate upon every case as soon as the diagnosis of appendicitis was made?

Dr Geo. W. Crile, Cleveland: I would not operate in all the forms of appendicitis. I would form no rule, but judge every case on its own merits.

Dr Thad. A. Reamy, Cincinnati: I would like to ask Dr Crile if in children, with their first attack, after the diagnosis had been made, he would recommend every case of that character for operation?

Dr Geo. W. Crile, Cleveland: I think that there would be no mistake in operating on any case of appendicitis during the time the inflammatory process was limited to the appendix itself, because such an operation does not carry with it any risk to speak of, but in the case of a child where the diagnosis was made after the infection has passed the appendix and the peritoneal cavity was involved, then the question of operating would depend entirely upon the individual case.

Dr F. F. Lawrence, Columbus: I feel very much indebted to Dr Crile for his excellent paper. I wish to emphasize one point which I believe to be a most important

one in connection with appendicitis, and that is, that there is a limit at which surgery should be released from its responsibility in these cases. You know of, perhaps have all heard, the statements made to the effect that in many people the primary attack was the only attack. Such statements are most frequently made by those who are diametrically and constitutionally opposed to operative procedures in appendicitis, whether in adults or children, and the same men tell us, as one did in discussing this subject a few weeks since, how they have trouble in making a diagnosis, but this one told me he had recently been able to make the diagnosis. However he was not able oftentimes when the surgeon had succeeded in making a diagnosis, of recognizing the disease, in other words implying that surgeons were removing appendices not involved. To put it in another way the surgeons are charged with aiding the undertaker if the patients happened to die, or that they did not have appendicitis if they happened to get well.

In those cases which Dr Crile mentions as belonging to the second class in which the infection has passed beyond the appendix, and you have a suppurative peritonitis set up, and the surgeons have made all attempts to save the life of the patient, then to be charged with the death of the patient if the case does not recover of course is most radically wrong. Operate, as Dr Crile says, upon all cases in the absence of general infection, or infection beyond the appendix. Operate where the infection is beyond the appendix if the condition be such as to warrant a reasonable belief that the operation will save life, but where it means simply for the surgeon to sign the death certificate it is not right for him to assume the responsibility.

Dr Dudley P. Allen, Cleveland: Last winter, on coming home after a long absence from the city, I operated upon five cases in which the abdomen was filled full of pus. These cases were about as desperate as any cases could well be. I opened the abdomen widely in each case, took out all the abdominal viscera possible, washed the abdominal cavity and contents thoroughly, and then put them back. Every one made a complete recovery.

Dr W. J. Means, Columbus: It seems in this discussion we are threshing the same straw that has been so thoroughly worked at every meeting of this Society as well as those of the American Medical Association for several years.

Unless we consider the subject from a clinical standpoint the garner will be no grain. Theoretically, Dr Crile's advice to operate before the infection has passed beyond the appendix may be good, but from a clinical standpoint it is impracticable. One of the established facts in appendicitis is that the exact pathologic conditions are not determinable by external examination. Several years ago I made an analysis of a number of cases, and operated within 30 hours of the attack. In a large percentage of these cases the infection had already passed beyond the appendix. In a number, the appendix was necrotic and enterolithes had escaped through the walls. It seems to me that until we are able to determine definitely the pathologic conditions which exist in such cases, we will be unable to make a rule along the line laid down by Dr Crile. Relative to diffuse suppurative appendicitis, I am inclined to believe we should give the patient the benefit of even a remote chance for life. Up until two months ago, my experience with such cases had been uniformally disastrous. At that time a case was presented with diffuse peritonitis which proved in operation to have had its origin in the appendix. Pus was found in the lower portion of the peritoneal cavity. The usual method of cleansing the cavity and the viscera with a saline solution was carried out. The patient hovered between life and death for three days, but rallied and got well. I believe the sentiment expressed by my worthy colleague, Dr Lawrence, should not prevail.

Dr Rufus B. Hall, Cincinnati: I agree with the sentiment expressed by the last speaker in regard to these desperate cases. While one dislikes very much to assume the responsibility of operating on them, I do not think that the surgeon's reputation, or his feeling in the matter, ought to have any weight if he thinks there is a possible chance of saving the life of the patient. While we all realize that the mortality in this class of operations is very great, yet I cannot see why in cases of death the profession should be criticised, especially when the family and friends have given their consent to the operation, and the surgeon is willing to perform it. It is simply giving the patient the last chance for his life. I could cite cases similar to those which Dr Allen has rehearsed to you, occurring in my practice where the abdomen was full of pus, and the operation saved their lives. I have operated upon other cases where there was

only a small quantity of pus with profound sepsis; these patients also made a recovery. There is no question but that they will die if they are left to themselves, and if the surgeon can save one case in 20 I think he ought not to complain about it. I want to protest against such a principle.

Dr O. T. Maynard, Elyria: I wish to say just a few words from the side of the general practician. In my own practice, and in consultation work, I now recall 12 cases which died from the want of an early operation, the operation being postponed. I do not now recall in my own practice a single case which has died from the operation which was done in time. If I, as a general practician, can recall a number of lives that were sacrificed from a delay in operating, there is no doubt many others who have knowledge of many such cases occurring in their practices and that of others. Even when the patient is very low he stands at least one chance of recovering if operated upon, and in those cases where the diagnosis is made early practically all the cases can be saved.

Dr B. E. Sager, Cleveland: Just a few words in reference to this subject. I think the consensus of opinion is in favor of operation. But what shall we do with those patients who will not submit to an operation? I can recall several cases who have had not only one attack, but recurrent attacks, and yet they would not submit to an operation. What shall we do in such cases, we, as general practicians? I have made it a point always in cases of appendicitis to call in the surgeon because his touch is much more sensitive, their knowledge of anatomy sometimes exceeds ours, and they are always ready to concur with us. Yet I have never found a surgeon who was fond of operating merely for the sake of operating. While I was abroad I found the most conservative surgeons in London, and also on the Continent, and what is true across the water applies to the American surgeon. I can recall six or eight cases of this disease, every one of which recovered under medical treatment. I am sure they were cases of appendicitis because good clinicians confirmed the diagnosis. I do not say these recoveries were due to the treatment, but will call them coincidences. The general plan of treatment followed was to give them a hypodermic of morphin, repeated as occasion required, using ice or antiphylogistin as a local applica-

tion, together with small doses of calomel internally until two or three grains had been taken, after which a tablespoonful of epsom salts was given. In one case there was no evacuation of the bowels from the above mentioned treatment, and we gave the patient about a pint of sweet oil together with four ounces of epsom salts and finally got an evacuation of the bowels. By flushing the bowels in such cases we often get good results, and oftentimes when we have given epsom salts, olive oil, etc., we will get good results from flushing of the bowels. Oftentimes we will find that we have an obstruction of the bowels when we have made a diagnosis of appendicitis. Sometimes we have appendicitis in these cases but oftentimes it is an obstruction of the bowels, or constipation, which is so common. Speaking from the standpoint of responsibility in desperate cases where the patient refuses operation (and some of these cases recover without operation) if the surgeon has been called in consultation, and they will not submit to an operation, we have then certainly discharged our full duty, and if they die, they alone are responsible for their death. If, however, they consent to an operation, and the surgeon gives them this chance for recovery, he is certainly not to be held responsible for their death if they should die after they are operated upon.

Dr Chas. L. Bonifield, Cincinnati: I did not get in in time to hear Dr Crile's paper, but the discussion has opened up the subject pretty thoroughly, and there are some remarks which I would like to make on the subject, more especially on that phase of the subject brought out by the last speaker. Those of us who did gynecologic surgery before we did abdominal surgery operated upon the uterine appendages before we did the veriform appendix have learned, or should have learned, some lessons from our work in the pelvis. We have learned that the uterine appendages may be removed in the early stages of inflammation, but it is not advisable to do so. We have learned that an operation performed on them during the height of the attack is very dangerous no matter who it is that does it. We have learned that the vast majority of these cases will run through the primary attack, and either an abscess will form which can be drained through the vagina or abdominal wall, and the patient then gotten in a better condition for a radical operation without running much risk; or the

inflammation will gradually subside without the formation of an abscess.

Now I take it that the pathology of the appendicitis and salpingitis is very familiar. The organs differ in this respect, the appendix is useless while the Fallopian tubes are valuable. I believe with most of the speakers that if appendicitis can be diagnosed within the first 24 hours of its existence that an operation is the proper treatment, and in the vast majority of such cases this treatment is successful. I do not however agree with what seems to have been the opinion of the majority of the speakers that whenever the diagnosis is made the case should be operated upon. My reason for not believing that is because of the high mortality which follows operation during the height of the acute attack. Many of these cases will go on to the formation of an abscess which can be opened just as easily as any other abscess, and then the patient can be gotten into condition for the radical operation if necessary, but oftentimes it is not necessary, as the last speaker has said. Quite a few of them, some of whom are doctors, will not consent to an operation.

What shall we do with those cases which we see too late for early operation? I think the suggestion of Dr Ochsner, of Chicago, is most valuable, *viz.*, empty the stomach and keep it empty, empty the intestines and keep them empty, then do something to quiet peristalsis and relieve the pain. In my opinion the best method of quieting the peristalsis and relieving pain is the application of icebags and the internal administration of veratrum viride. Veratrum viride will relieve the pain as efficiently as morphin and the relief is more lasting. It has another advantage over morphin in that it does not stop the secretions of the skin, bowels or kidneys, on the other hand has a tendency to stimulate them, and probably had a decided action on the liver. Under this treatment I believe that the majority of cases of appendicitis which we see too late for the early operation can be tided over until a time at which a late operation can be safely done.

Dr F. D. Case, Ashtabula: My experience in the treatment of appendicitis has been so uncommon that when I have related it to some of my surgical friends they have looked at me out of the corner of the eye, and seemed to question my veracity. It is about 30 years since I saw my

first case of appendicitis, and I have yet to see a case of appendicitis under my own care die. Now I do not mean by that that I have any secret process by which I can cure appendicitis. I do not mean that all cases of appendicitis under any management will get well, but that under reasonably good management a great many cases in which operation is advocated would recover without operation. Some of these cases have been cases of septicemia, in some of them abscesses have broken through the abdominal wall, and in others they have broken into the colon, or at least into the bowel, and still they recovered. Now I am satisfied that operation was indicated in some of these cases, but that was in the day before operation was suggested as it is now. I am of the opinion that if the food is stopped, if peristalsis is stopped, if the bowels are washed out by enemata, that is following out the plan suggested by Dr. Ochsner, of Chicago, many of the cases which are considered too desperate to be operated upon will recover, and perhaps some of those which are operated upon and die *might* recover under this treatment.

I believe that conservative surgery is to be advocated in the treatment of appendicitis. I recall a case of a railroad man whom I treated less than three months ago, a patient whom I saw for the first time five days after he was taken ill. Complete abstinence from food was ordered and continued for five days, or until a natural and spontaneous movement of the bowels occurred, which was about 10 days from the beginning of the illness. I believe that much is to be said on the question of not feeding instead of what shall we feed.

Dr Thad. A. Reamy, Cincinnati: How do my friends know to a certainty that these cases unoperated on will die? I have done my share of operating. Very recently, I think, I saved the life of a young man in Indiana by operating after 60 hours had elapsed from the onset of the attack. It was likewise a recurrent attack. The appendix was largely destroyed by suppuration. No, I am in no way opposed to surgical methods in these cases. Put me down in no such antiquated lists. Nevertheless, it is my opinion that many of the claims made in this discussion are too radical, dogmatic. If a case died after surgical operation, no matter at what stage the operation may have been done, almost invariably we hear "operation too long

delayed." Yet we all know, at least I know, that cases operated on as early as possible after diagnosis is made, and by experts claiming, and justly so, high skill and success in such work, do die. On the other hand, we all know, at least I know, that not more than one-third of all the cases of appendicitis occurring in this country are operated on. This is true even now after we have worked surgical enthusiasm to the highest pitch, such results having been obtained. And yet, the mortality from unoperated appendicitis cases is not high. It must be understood that my remarks apply to the whole field. In not one-half of the children attacked is there a recurrence. In many cases the diagnosis is colic. But this is not general. In country practice, especially with children, the patient is put to bed, hot or cold, as case may be, applied over the seat of pain, or tumefaction, all food withheld, full doses of tincture of veratrum administered and continued. If the pain is intolerable, opiates by rectum or by the mouth, or hypodermically, are given. In many of these cases the disease is cut short; in others typhilitis or perityphilitis supervenes. In such cases the external tumefaction continues often for many days, but recovery without, and sometimes with, suppuration follows. Now the reliable statistic facts are not at hand to warrant wholesale condemnation of the country practician who has, in many instances, so treated these cases. Even should an occasional unoperated case of this class die, as will occur, the death cannot be charged to the family physician until the time comes, for it is not yet true that every such case operated on by skilled hands recovers. Unquestionably a certain proportion of the cases operated on that die would have recovered under the plans of medical treatment indicated without operation. *Per contra,* some cases not operated on that die could be saved by operation. Let us not be so boastfully dogmatic. As to the question of operating in desperate cases, I have no sympathy with the remark made tonight that the surgeon should decline to operate, when to do so jeopardizes his reputation. No man has a right to shirk duty. The highest interests of the patient are paramount to all other obligations.

Dr Geo. W. Crile, Cleveland, closing: I do not wonder that Dr Reamy did not understand under what conditions I would operate on children because I omitted a page in my paper which probably explains my views on this subject.

I think that Dr Reamy's experience is a little bit different from that of many others because his experience has largely been with children. Appendicitis occurs much more frequently in adults and young adults than in children. The point however to be considered is operation at the beginning of the attack while the inflammation is limited to the appendix itself. This I consider to be a conservative measure. If I myself had an attack of appendicitis I would prefer to be operated upon within an hour or two after the beginning of the attack, removing the appendix as a conservative measure. I have seen some very bad attacks of appendicitis in children, and I think if you can remove the appendix in these cases before the acute symptoms develop, as a conservative measure, the operation ought to be done. It is a question as to how you can best save the greatest number of lives.

From the general trend of the discussion I think perhaps that I have been a little bit misunderstood. I would not operate upon every case in which a diagnosis of appendicitis had been made. I do not mean to say however that I would hesitate to take the responsibility of an operation where the case was very bad. There are many things to be considered in connection with an operation for appendicitis, a patient's surroundings, whether he can be moved, whether he can afford a nurse, etc. Take a patient in an acute attack, say 36 hours to 48 hours after the onset, with the abdomen distended, etc., I think it better to treat such cases through the attack, but as to taking the responsibility of an operation when necessary I think we ought always to be willing to take that.

Dr Sager has spoken of patients recovering by medical treatment even after many weeks of illness. These cases do not argue against an operation, but rather for it. I myself would much prefer to perform an operation immediately, at the beginning of an attack, and let the patient out with the slight degree of danger than to wait and finally have a perforation through the bowel and a convalescence extending over many weeks or months.

Diagnosis and Treatment of Injuries to the Spine

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The spinal column and cord are exposed to many kinds of injuries that may be immediate or remote in their effects. Through the massive bodies of the vertebra the spinal column forms a pillar or axis for the support of the rest of the body. Its flexibility and strength are maintained by the peculiar conformation of the vertebra, and the attachment of numerous powerful ligaments and muscles. Another important function is the protection of the spinal cord and safe exits for the spinal nerves. These considerations, however, are matters of anatomy, so well established and known that any detailed description would be superfluous in this paper.

Owing to anatomic conditions, certain portions of the spine are more subject to injury than others. The dorsilumbar and the cervicodorsal arches are more subject to sprains as they are less flexible than other portions. Owing to the close proximity of the head, the cervical region is a frequent point of injury. The upper part of the dorsal curve is relatively weak and exposed, and is, therefore, one of the commoner regions for fractures.

Injuries may be divided for clinical purposes into two classes, one in which the lesion is confined to the spinal column involving only the bony and soft tissues, and the other in which the spinal cord is involved as well. In making a diagnosis of an injury great care must be exercised in determining the location, character, and extent of the lesion. It happens sometimes that apparently trivial injuries at the start prove to be serious ones later.

I have selected a number of cases that have come under my care in the last four years, that illustrate the various forms of injury with resulting complications.

Case I: The patient, a female, aged 25, housewife by occupation, in moderate circumstances, was hurt in a railroad wreck June 10, 1898. At the time of the accident she did not complain of being hurt, but after the excitement had worn off she found that her neck was stiff, and that any movement of the head was quite painful. An examination 48 hours after the accident found the patient vomiting, and complaining of pain in her neck, head, and arms. She was nervous and unable to sleep. The objective signs were slight swelling and tenderness over the sixth and seventh cervical and eighth dorsal vertebra. There was considerable rigidity of the muscles of the back, neck, and shoulders, there was no discoloration or deformity. She complained of tingling in her hands and arms. There was partial paralysis of sensation and motion in both arms; there were no paraplegic symptoms. The patient continued to grow more hysterical, and the local symptoms became more pronounced. In the course of four weeks there was a subsidence of the gastric disturbances, but the insomnia continued. Motion and sensation in the arms gradually improved. She continued to improve slowly for several weeks, when a damage suit was started against the railroad company. She then lapsed into a nervous state with both neurasthenic and hysteric manifestations. On February 17, about eight months after the accident, the patient was troubled with insomnia, neuralgic pains over the left side of the neck and face, and the left shoulder, arm, and side. There was marked paralysis of the left arm, both in motion and sensation. The arm was considerably atrophied. There were no trophic changes, however, in the hand and fingers, the atrophy being due to lack of use. She had occasional attacks of dysphagia. An examination of the vertebra was negative so far as any lesion could be discovered. The patient complained of tender places in different portions of the back. I advised the railroad company to make a settlement with her, which was done. After the settlement she began to improve, and is now fully restored to her former health.

Diagnosis: Primarily, a sprain of the spine in the lower cervical and upper dorsal region; secondarily, traumatic hysteria.

The treatment of this case in the acute stage, was the usual one for sprains of the spine; cold applications in the beginning over the injured parts, and cupping were em-

ployed, and later applications of hot water, stimulating liniments, ichthiol, and lanolin ointments were used.

Case II: The patient, a female, aged 32, married, mother of three children, in moderate circumstances, was hurt July 4, 1900, while on a street-car, in a rear-end collision. The jar threw her backward, causing over-extension of the spine at the dorsilumbar region. She was unable to go to her home without aid. A physician saw her two days later. She was then suffering from inability to move her legs, or to turn in bed. There was tingling and numbness over the anterior portion of the thighs and in the feet, and retention of urine; her temperature was 101°, and a frequent pulse; there was some swelling over the dorsilumbar vertebra, and considerable tenderness. I saw her in consultation 10 days later. There was considerable numbness over the lower portion of the body, and over the extremities, muscular weakness, inability to turn in bed, constipation, and retention of urine. With considerable exertion she was able to flex her legs; no deformity could be found along the spine. The patella reflexes were increased. The case was diagnosed as a sprain in the dorsilumbar region. This patient was bedfast for some weeks, when she regained her health sufficiently to get about the house. A suit was instituted against the railroad company, during the pending of which the patient continued to suffer more or less inconvenience. I examined her at repeated intervals during the next four or five months. There was diminished sensation over the hips and around the body in a line with the crest of the ilium. There were patches of anesthesia, and some points where the sensation increased. She was unable to assume an upright position. She complained of an irritable bladder, and constipation of the bowels, and was unable to make the least exertion toward her household duties. She became a marked neurasthenic with more or less hysteria. After the damage suit was settled she began to improve and at the present time suffers no inconvenience from the injury.

Diagnosis: Primarily, a sprain of the spine in dorsilumbar region; secondarily, traumatic neurasthenia and hysteria. The treatment consisted primarily of applications to the spine, rest, and massage.

Case III: The patient, a male, aged 70, a mail clerk, in good circumstances, and social environments above the aver-

age, was hurt March 15, 1901, in a railroad collision. I examined him March 17. He then complained of considerable tenderness of the middle dorsal region. There was no deformity except from swelling. He was unable to turn in bed without help, but could use his legs without much trouble. There was no evidence of paralysis, either sensory or motor; he had some difficulty in urinating, but it did not amount to retention; the bowels were constipated. After a few days the tenderness disappeared, and he was sent to his home 30 miles distant. After a few weeks there developed pains around his body, tingling, numbness in his legs and feet, considerable limitation in motion, and a lack of coordination. There was some tenderness over the fifth, sixth, seventh and eighth vertebras. I examined him again on May 16, and found limited function of the right arm, and inability to flex the thumb and index-finger of the right hand; there was tingling and loss of sensation in these members; tenderness over the upper dorsal and lower cervical region of the spine, pressure over the fifth and sixth cervical produced pain in the index-finger of the right hand; there was some limitation of motion in neck; he complained of pain in his right shoulder, arm, thumb and index-finger; and there was also numbness, and vertigo. A settlement was made with the railroad company a few weeks later. The patient made a gradual improvement thereafter. At the present time he is following his usual occupation.

Diagnosis: Primarily, a contusion of the soft tissues over the middle dorsal region; secondarily, traumatic neurasthenia.

These three cases represent a class that follows an injury to the spine, and is known as "railway spine." The primary injuries were not severe. The spinal cord, evidently, was not primarily involved, and I doubt if the ligaments were materially affected. It was obvious that there was nervous exhaustion, due to shock and mental worry. The treatment of such cases consists largely in rest both to mind and body. The environments should be conducive to all of these conditions. Galvanism may prove beneficial.

Case IV: A male, aged 40, traveling salesman, a large, fleshy man, with one leg amputated, was hurt August 21, 1898, in a railroad collision. He claimed he was thrown in

such a manner as to produce over-extension of the cervico-dorsal region. He was confined to his bed two weeks, during which time his physician stated that he complained of pain in his back, some difficulty in moving his extremities, pains around his body, incontinence of urine, and at times hematuria. The physician further stated there were no physical signs of an external injury. He recovered sufficiently to go to work in 60 days after the accident. He then made a claim against the railroad company for damages. I examined him six months later for the railroad, with a view to a settlement of the claim. The patient then complained of pain in his head, slight tingling in his right arm, pain in the muscles of the cervical region when he moved his head in any direction, and insomnia. He also complained of pain when pressure was made downward on the head, and of tenderness over the lower cervical and upper dorsal vertebra. The physical examination was absolutely negative, so far as any positive signs were concerned. I advised the companythat in my judgment he was a malingerer, and his claim should be rejected. The suit was never pushed. The gentleman is well at the present time, and has not complained of spinal trouble for two years.

Diagnosis: Primarily, a sprain of the spinal muscles, from which he completely recovered in three or four months. The treatment carried out by the physician was about the same as mentioned in previous cases.

In some respects this case was similar to those above mentioned, but he did not have any of the typical signs of neurasthenia or hysteria. The later development of pain, and other symptoms, and muscular weakness, was the result of careful calculations to beat the doctors who were to testify in the pending damage suit.

Case V: A male, aged 40, an engineer by occupation, was hurt in a railroad collision February 19, 1902. I saw him a few hours after he was hurt, and found considerable contusion of the muscles over the lumbar vertebra. He was unable to move his right leg, and complained of numbness and tingling in it. Motion was somewhat limited in the left leg. Occasional pains would shoot down both legs; there was no reflex disturbance nor diminution of sensation. The bowels were constipated, but the bladder was unaffected. The case was watched with considerable concern. Motion

returned to his right leg in two or three days, and the tingling and numbness disappeared. He was lame for several weeks, but eventually returned to work. This was evidently a case of contusion of the muscles over the lumbar region with more or less shock to the nerve-cords. The treatment consisted of absolute rest, with cold applications to the seat of the injury, cupping, and later stimulating liniments.

Case VI: A male, aged 23, was hurt February 11, 1899, in a railroad wreck. I saw him the same day he was hurt. There was some swelling over the vertebra at the dorsilumbar region. There was partial paralysis of the right leg, but no marked diminution of sensation. The function of the left leg was somewhat limited, but it seemed to be due to muscular soreness rather than paralysis. There was numbness and tingling in both legs; also paresthesia of the skin around the hips and perineum. He was placed in bed and kept at rest. He improved steadily and was discharged in one month ready to go to work. A few months later he complained of numbness in his right leg, but it disappeared with rest, and the application of galvanism.

Diagnosis: A sprain of the dorsilumbar region. The treatment consisted of absolute rest with cold applications to the seat of the injury, dry cupping, and massage.

Case VII: A male, aged 38, a painter by trade, fell from a scaffolding, lighting on his back across a scaffold. I examined him a few hours after the injury. There was a large swelling over the last three dorsal and first two lumbar vertebras; there was considerable discoloration of the skin; the patient was unable to move his legs; in fact, there was almost complete paraplegia of the body and legs below the seat of the injury; there were areas, however, of sensation, and certain groups of muscles would respond to electric current; there was retention of urine and constipation. The patient was confined to his bed for several weeks. He was treated by applications of ice to the spine for three or four days. The bladder was carefully looked after, and the rectum kept free from an accumulation of feces. The paralytic condition gradually improved. At the end of two months he could walk with help around the room. The bladder gradually regained its normal function. Rigidity of the spinal column continued, and from present indications it will be permanent. He also suffers more or less from pains in his legs and from constipation. The rigidity of the spine makes

his gait peculiar, and is indicative of muscular weakness in his legs.

The case is in some respects similar to Case 6, but more severe. I suggested an operation at the time, but it was not permitted. There was evidently considerable hemorrhage around the spinal nerves and cord, and perhaps within the dural cavity. It is my opinion now that he could have been benefited materially by an operation.

Case VIII: A male, aged 27, a railroad engineer, was hurt September 9, 1899. I saw him two hours after the accident and found him unconscious. Other than a Colles' fracture of the right wrist, there were no marks of an injury about the head and body, except on the spine. There was a swelling, symmetric on both sides, over the lower dorsal and upper lumbar vertebras. I could not detect any displacement of the vertebras nor of the arches. Consciousness returned within 12 hours. It was then discovered that he was paralyzed below the waist-line. The paralysis was complete. There was no response to heat, cold, or pricking. Motion was entirely gone. The reflexes were absent. All the signs of complete solution of the cord existed. A laminectomy was suggested, but was refused. The treatment, therefore, was rest, cold applied to the spine, cupping, massage, and liniments. The bladder was looked after every eight hours, and the rectum cleaned out every day. At the end of the first week sensation over limited areas appeared, and twitching of muscles in legs and feet could be detected. Improvement continued slowly. At the end of the second week he could move his toes and feet; at the end of 30 days he could flex his legs slightly at the knee. Sensation returned in about the same proportion. It was three months before he could move his legs sufficiently to bear any weight. He continued to improve slowly, and after several months was able to walk around with a cane. The bladder resumed its normal function. At the present time there are contractures of the muscles in both legs, and rigidity of the spine, producing a halting gait. He was treated with massage and galvanism for several months.

Diagnosis: Sprain of the lower dorsal region with contusion of the cord and possibly hemorrhage into the dural space.

Case IX: A male, aged 23, a railroad brakeman, was hurt January 20, 1900. I examined him 24 hours after the accident. He complained of pains in his back and legs, numbness, and tingling in his feet. He had difficulty in moving his legs and could not turn in bed. The right leg was more helpless than the left. There was diminished sensation in both legs. There was swelling over the dorsilumbar region. No crepitus or deformity could be detected. There was retention of urine, and constipation. The treatment mentioned in the other cases was carried out and rapid improvement followed. The sensory disturbances had almost disappeared at the end of 21 days, and he had good use of his legs as he lay in bed. Suddenly there was a reappearance of the paraplegic symptoms. In 24 hours later he had no knowledge of his legs; could not distinguish heat or cold, and the reflexes were abolished. There was no rise in temperature, and no increase of pulse. The sudden onset of the paralysis and the absence of inflammatory symptoms lead me to believe there was hemorrhage in the dural space, and possibly intramedullary. These conditions continued much the same for several days, when there was some evidence of improvement. It was three months, however, before the patient could use his legs to any extent. He was treated with massage and galvanism, the bowels were kept open, and his general nutrition was looked after. At the end of one year he was able to walk around, but he had to use a cane. He could not use the right leg as well as the left. At the present time he is at work, but the right leg is not as large as the left, showing some nutritional disturbances. This was an interesting case, largely because of the secondary manifestations.

This completes another group of cases coming under the head of sprains of the spine. Two of them are uncomplicated cases as evidenced by their rapid improvement and permanent recovery. In the other three cases the cord was evidently involved. In the absence of signs of fracture or external wounds, a diagnosis was made of laceration of the ligaments, and contusion of the cord with hemorrhage.

Case X: A male, aged 17, a laborer by trade, was hurt in March, 1899. He was caught under a shifting-load from a wagon. The weight doubled him forward, causing fracture of the fifth and sixth dorsal vertebras. I saw

him three days after the injury. There was marked deformity over the region mentioned, crepitus could be detected, and there was considerable swelling, due to the extravasation of blood. There was complete paralysis of motion and sensation. There was no response to any irritant applied to the extremities or body below the ribs. The reflexes were gone, and there was no retention of urine. While the symptoms pointed to a destruction of the cord, there remained some hope that the paraplegia was due to pressure. An operation was suggested to the patient and friends and was granted. A laminectomy was made the next day after my first examination. The spinous processes and arches of the fifth and sixth dorsal vertebras were found broken, and the fragments were impinging upon the cord. These were removed and the cord was carefully examined. It was found intact. The incision was closed up and healed by first intention. The patient had relief from some of his distressing symptoms within 36 hours after the operation. The improvement continued steadily, and he was discharged in six weeks, able to walk with crutches. He later made a complete recovery.

Diagnosis: Fracture of the spine with compression of the cord. The treatment as mentioned before was entirely operative. After the pressure was removed from the cord, there was nothing more to do except to manage the case as in other wounds.

Case XI: A male, aged 23, a laborer, was hurt by falling from a tree. He was completely paralyzed from the inception of the injury. I examined him four days after the accident and found him completely paralyzed below the umbilicus. There was marked deformity of the seventh and eighth dorsal vertebras; no crepitus could be detected. A laminectomy was made, and a dislocation of the fourth and fifth dorsal vertebras was found; the cord was completely severed. The wound was closed and healed by first intention. The patient lived 10 days and died of hypostatic pneumonia.

Case XII: A male, aged 35, a farmer, was caught under a house that he was helping to move and doubled forward. When he was taken out from under the building, it was discovered that he was paralyzed below the seventh and eighth dorsal vertebras. I did not see him until 18 months after the accident. I had to depend entirely upon the patient and

his friends for the history of his condition and the treatment. At the time of my examination I found a deformity over the region of the seventh and eighth dorsal vertebras. There was paraplegia below the line of the ilium. Atrophic disturbances were marked in the extremities, and also in the body. Several large ulcers existed on the legs. He suffered from retention of urine, necessitating the use of the catheter every few hours. There were some areas over the extremities where sensation was almost normal, and at several points there was complete anesthesia. Hyperesthesia existed at the paraplegic line around the body. He had slight movement of his right foot, and also of the toes on his left foot. There was sufficient evidence of vitality in the extremities to warrant a diagnosis of pressure upon the cord without complete destruction. An operation was advised with a guarded prognosis. An incision was made over the deformity, and a dislocation of the seventh dorsal was found. The tranverse processes were displaced and the cord was compressed. The arch of the seventh and eighth vertebras were removed, freeing the cord from all pressure. The incision was closed, and healed by first intention. It was two weeks after the operation before any signs of repair could be detected. The first improvement noted was a relief from the darting pains of which he had complained for several months. Later the nutrition of the parts grew better, and eventually the ulcers healed up. Two years later the patient was able to walk, and has since that time been able to move around in a limited way.

Case XIII: A male, aged 11, a school-boy, was shot by a burglar invention arranged in his father's store. The bullet entered just below the left clavicle and passed backward into the spine. Paralysis of the body and lower extremities followed immediately. I first examined him a week after the injury. He was unable to move his extremities. There was more or less anesthesia of the skin from the nipple-line down; there was also incontinence of urine, constipation, loss of reflexes, and considerable vasomotor disturbance. From the area of paralysis, it was evident that the cord was injured about the fourth or fifth dorsal vertebras. Dr George M. Waters made a radiograph, which detected the bullet near the body of the fourth dorsal vertebra. A laminectomy was made and the bullet was found lodged between the laminæ of the fourth and fifth vertebras. It had perforated

the body of the fourth dorsal vertebra, crossed the canal, and had lodged in the position mentioned. There was considerable inflammatory exudate and blood-clot surrounding the bullet and in the canal. The cord was lacerated on one side. The bullet was removed, the blood-clot taken out, and the wound closed up with drainage. Following the operation there was considerable fever caused by infection of the wound. Nutritional disturbances followed, and a large bedsore formed over the sacrum. Later the extremities were more or less affected, but by careful massage no ulcers developed. It was two weeks after the operation before there was any noticeable relief in the paralysis. After that time he continued to improve slowly; the nutrition of the parts became better, and he could flex his legs at the knees. When he left the hospital, five weeks later, his general condition had improved very much and the sensory disturbances were markedly better. The retention of urine continued, and the paralysis of the rectum remained the same. A recent letter from his father states that he has improved considerably. There is now a normal condition of the bladder and a limited sensation in the bowels. He is able to sit in an upright position, flex his legs upon the body, and help himself materially in moving around. He also mentions that he is well nourished, that his growth has not been retarded, and that the development of his legs is in proportion with that of the rest of the body.

The diagnosis in this case is apparent. There may be an interesting question as to how far the cord was lacerated, but I am not prepared to state that the laceration extended beyond the dura mater. The accumulation of blood and inflammatory exudate would produce sufficient pressure upon the cord to cause paraplegic disturbances. However, the recovery of the patient from such an injury shows, first, the possibilities of surgical interference; and second, the recuperative power of the cord following a well-defined lesion.

Additional cases might be recorded, but they would only add to the number without emphasizing any particular feature in diagnosis or treatment.

It is not difficult to diagnose a sprain primarily. The history of the accident, followed by pain in the back radiating along the distribution of the nerves, tenderness over a

limited area of the spine, stiffness and rigidity of the muscles, point definitely to such an injury. The rigidity in some cases produces a condition that might be termed *pseudo-paralysis* of the legs, bladder, and bowels. This can be differentiated from a true paralysis by the lack of sensory and motor disturbances in the parts below the seat of the injury, by the absence of reflex changes and later by a complete recovery from the rigidity as soon as the tenderness disappears from the injured parts.

Traumatic lumbago is met with frequently, as a complication, and is often annoying to the physician. The patient imagines his injury involves the spine, and becomes apprehensive of paralysis and ultimate helplessness. A patient suffering from traumatic lumbago may be unable to turn in bed, to assume an upright position, or to put himself in position to obey the calls of nature. In these cases there are no sensory or motor disturbances in the extremities. The trouble yields to the salicylates internally, and the application of heat to the back, and rest.

To differentiate between shock to the nerves from concussion causing temporary paralysis, and hemorrhage in the canal causing pressure, is not always an easy matter in the primary stage.

We are taught that hemorrhage may be intramedullary or extramedullary. In using the latter term it should be understood, I think, that a hemorrhage may be extradural as well as in the dural space. In three of the cases reported I am satisfied that hemorrhage followed lacerations of the ligaments and small blood-vessels, and the resulting clot produced pressure directly upon the cord. I was unable to determine whether the clot was in the dural space or extradural. We should understand that paraplegia may be produced by various cases. Among them may be mentioned those that produce paralysis immediately after the accident, such as direct injury to the cord and roots of the spinal nerves from shock or contusion, intramedullary hemorrhage causing disintegration of the cord, contusion of the cord

from displacement of the vertebras, complete severance of the cord from a penetrating missile, or from fragments of fractured laminæ. Paraplegic symptoms coming on sometime after the injury, may be caused by secondary hemorrhage around the dura, or within the dural space; also from inflammatory exudates and degeneration of the cord.

It is well understood that the phenomena of paraplegia varies at different levels of the spine. These phenomena are tabulated in almost every text-book on surgery; therefore a rehearsal of them in this paper would not be profitable. It may be interesting to note here that the clinical signs of complete severance of the cord were present in three of my cases; two of them were operated upon, and the cord was found intact in one and severed in the other. The other cases recovered without an operation, which demonstrated that the cord was not severed. This experience demonstrates to my mind that we have not sufficient experience or exact data to determine definitely whether the spinal-cord is severed or not in the primary stage. It is not always an easy matter to determine the exact level of the injury. The lesion may be higher than the external signs would indicate. This is especially true when a blood-clot is producing the paraplegia.

A diagnosis of fracture or dislocation is not difficult. The deformity in the latter is always well marked. In fractures without displacement there are not necessarily any serious phenomena, and therefore a differential diagnosis is immaterial. If there is displacement the deformity is marked and the conditions are easily determined.

The treatment for injuries of the spine are both expectant and operative. Under the former management, rest is one of the most important proceedings. Primarily cold applications to the injured part give considerable relief to the patient and modify the reactionary processes. Heat may be substituted later; massage applied to the back and extremities usually does some good; ichthiol ointment and stimulating liniments with galvanism complete the local

medication. Strict attention should be given to the bladder and bowels. The rectum should be kept free from accumulation of feces. It is important that the injured area should be made as nearly aseptic as possible, and kept in that way while danger of infection obtains.

The operative treatment consists in making a laminectomy, and relieving the cord of pressure from clot or impinging vertebras. The technic of this operation is so well described in all of the standard works on surgery that a description here is superfluous. The most difficult problem for the surgeon to solve is, what are the indications demanding an operation. It is an operation that in the primary stage of the accident is followed with considerable mortality. According to Lloyd, who has collected the statistics of a number of cases, the mortality is about 50%. The one death that occurred in my cases was not due to the operation, but none of them were made until the patient had reacted from the shock of the accident. Quoting from Lloyd, he says: "These statistics are decidedly against immediate operation, and we most rigidly advise never to operate until it is evident that the patient will not succumb to the direct effects of the injury. As soon, however, as he has recovered from the shock, and his exact physical condition is known, the operation should be performed.

Quoting from McCosh on this subject he says: "In the severer cases, there can seldom be question between mere concussion and compression by bony fragments. The question, however, will be whether the cord will be completely crushed or whether it be merely contused and pressed upon by broken bone. In many cases it is impossible within the first few hours to determine which of these conditions is present. A day or two's delay will probably settle this point. But it is exactly such delay which makes the recovery hopeless."

Rose, in his work on surgery, says: "If, however, it seems likely that a portion of the cord has escaped, operation may be attempted, on the chance that when pressure has been

removed sufficient cord substance may still remain to permit of some degree of functional repair. There will always be, therefore, a certain number of cases in which it will be a matter of doubt as to whether or not any benefit will accrue from the operation. The final decision, under such circumstances, will depend on the special predilections and opinions of the surgeon who is in charge of the case, and the general state of the patient."

My own conclusion, based upon personal observations and the consensus of opinion of the leading surgeons of the country, is to operate in all cases after the primary shock has disappeared, where the paraplegic symptoms indicate serious trouble with the cord. I do not believe that disintegration of the cord takes place as early as supposed by a number of surgeons whose writings I have examined. An operation should be made, if possible, before any inflammatory processes take place. In the absence of infection this would be an indefinite period.

CONCLUSIONS

First: All injuries of the spine, no difference how slight, should be carefully examined by the surgeon when the patient presents himself.

Second: Owing to the frequency of secondary developments a guarded prognosis should always be given.

Third: There are no positive signs of a complete severance of the cord in the primary stage of an accident.

Fourth: The treatment of injuries to the spine, other than operative, consists, primarily, of a rest in a horizontal position, applications of cold, attention to the bladder and rectum; secondarily, massage, galvanism, and stimulating lotions.

Fifth: A laminectomy, made after the reaction from shock, is not a dangerous operation.

Sixth: A laminectomy is the only rational treatment for pressure on the cord from blood-clot or depressed bone.

Seventh: Relief may follow a laminectomy which has been made several months after the inception of the injury.

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DISCUSSION

Dr E. G. Carpenter, Columbus: The writer of this paper is to be congratulated not only upon his method of operation, but also upon his choice of a subject, which is one in which there are some mooted questions, which are of interest to ever practician of medicine, for the reason that whatever affects the brain and spinal cord generally affects more or less many of the other organs of the body—hence it reaches out and touches almost every branch of medicine.

The general impression in regard to the functional nervous conditions induced by traumatism, I think is erroneous. This impression would rather lead us to infer that all of these psychoses or conditions have associated with them more or less fraud. I think to adopt this idea wholly would be a mistake. I believe that traumatic hysteria, while to a great extent is a functional disease, on the other hand the condition of traumatic neurasthenia is a positive entity. These two conditions have been beautifully outlined by our guest, Dr Dercum, in his work, in which he gives us a definite picture of each one of the conditions. In approaching any of these cases it should be, not first with a prejudice in your mind that you have a case of fraud on hand, with a determination to consider the symptoms in the case and to make up your mind as to whether the conditions have resulted from conditions caused by the injury, whether an injury exists there, or whether the condition is due to suggestion we might say by the shock itself. Fraenkel has shown in these cases of traumatic hysteria that old impressions received at sometime past in their lives would be brought out by a shock, *e. g.*, a person who had seen a case of hemiplegia and afterward receiving a shock, or impression that they were injured, would imitate the actions of a person ·ving the hemiplegia, or the impression registered on the ·d of such a person may be some person with a paralyzed

arm or leg, and then in their hysteria produced by shock or otherwise these conditions would be simulated.

Traumatic neurasthenia I believe is a positive condition and I further believe it is a condition which may be produced rapidly. Because certain cases recover suddenly, or apparently suddenly, does not argue that such were cases of fraud, and again such recoveries should be received cautiously, and we should not be influenced to go from one side to the other too hastily.

To illustrate these two conditions briefly from two cases seen by me in the past. The first case was that of a young man, a professor in a college, having charge of the gymnasium. He came to see me to ascertain whether he had an organic lesion of the cord. He had a history of having suffered from neurasthenia. While he was in that condition he was playing lawn tennis and in attempting to loft the ball he missed it and caused a wrench in the lumbar region. From that time on he complained of such symptoms as would lead one to believe that there was some organic lesion of the cord, but upon examination there was found to be no condition which would cause us to think that there was an organic lesion. When he was assured of this fact the symptoms passed off. This was really a case of traumatic lumbago which caused the young man to think he had injured the cord. This illustrates a case of traumatic neurasthenia.

To illustrate a case of traumatic hysteria I will cite the following example: A colored man was walking down the streets of Cleveland when he suddenly became paralyzed. He was carried off to the City Hospital and was afterwards examined there. It was surmised that he might be suffering from some lesion of the cord, or perhaps the brain was affected, and it was thought if he was operated upon he might be relieved.

Dr C. E. Beardsley, Ottawa: I rise to commend the paper of Dr Means most highly, and also to relate a case which came under my notice. I was called by the C. H. & D. R. R. officials to make an examination of a man who claimed to have been injured on the C. H. & D. R. R., and undoubtedly he was injured to a certain extent because the attending physician said that he had retention of urine, and in drawing it off, or if he could void it, it was bloody in character. I saw him 11 months after the accident occurred.

He claimed to have entirely recovered from the trauma with one exception, that was that he had lost his "manhood." He sued the railroad company for $10,000 and had them dead to rights. There were two tracks beside the main tracks. One of the tracks was to accommodate a warehouse, intended for a switch-track for trains. At the time of the accident a car was loading from a chute on the track constructed for the accommodation of the warehouse. The man was standing in the doorway beside the chute or pipe, when the train was backed in and struck the car being loaded. The man caught between the car door casing and the chute crushing (or squeezing) him to such an extent that he fainted on being released. He was carried on a stretcher to his residence. He complained of much pain through his hips and over the pubes and had a constant desire to urinate which could only be relieved by means of an instrument. The urine was bloody for some days. On my examination I was unable to find any lesion, subjectively, objectively, or by physical exploration. He said that he was impotent as the result of the accident. I knew of no means by which I could differentiate fact from fiction in this case, but it was by a happy coincident I obtained information which aided me in the diagnosis. I was invited to this gentleman's residence and discovered his wife to be pregnant. I learned from her that she had been about five months in that state. My friend (the subject of this talk) and I strolled out on to the street and I said to him, "Now, my friend, since your injury, some months have elapsed, ten at least. Will you inform me who has been here since you have been gone?" I advised him to settle for $300.00, which he did, received the premium and that was the last of his impotency. Therefore I am constrained to believe there are more malingerers than the author of the paper seems to set forth in his address.

Dr Wm. E. Wirt, Cleveland: We are led to believe that in these railroad cases after the patients get a settlement they generally get well. I think we are often justified in this conclusion, but to assume that this is the absolute rule I think is not correct. I have had several experiences wherein I found myself mistaken. I recall one case of a railroad engineer who had been injured in a collision, who was brought to me by his family physician. I found upon ·mination that his spine was sensitive and rigid. The walked with a dragging of his limbs, but I could not

find any definite lesion, so I was constrained to tell the physician that I believed his patient was malingering. He got a settlement out of the railroad company, but continued to get worse and in less than a year he died.

In another case where a man was injured in a railroad accident there was incontinence of urine and feces with rigidity of the spine, that is a rigidity of the lumbar muscles on the one side, with a dragging of the limbs. It has generally been understood that where there is a rigidity of the lumbar muscles on one side that there is no malingering in such a case. There was some doubt, however, in this particular case. The man got a settlement from the railroad, and in spite of this the man has made very little improvement. He is still unable to walk without two canes to support him and there is some incontinence of urine. He is not a well man by any means.

The third case was that of a lady who was also injured in a railroad accident, and at that time received a severe blow over the back of the neck. The parts were very much swollen, and she was compelled to give up her work. After some months she attempted to return to work, but on account of pain, headache, etc., she had to give it up again. In the meantime a growth appeared on the spinous process of the cervical vertebra. She was operated upon for this, and I assisted in removing what appeared to be an osteoma. There was no microscopic examination made of it, but it did not appear to be malignant. This lady obtained a good settlement from the railroad company, still she is not a well woman. She has never been able to return to her original work, and I do not believe she will ever be a well woman. So I have found that not all of these cases get well when they a get a settlement, and I think this should always be borne in mind.

Dr Martin Stamm, Fremont: I would like to ask the doctor a question. Where all of the reflexes are abolished, and remain so for weeks, would he operate upon such a case?

I had two such cases where I was urged for weeks to operate. One of these cases was operated upon about four years ago. The patient, a boy 16 years of age, fell from a tree. He presented symptoms of fracture in the eleventh dorsal region, and all of the reflexes were abolished. He did not improve for weeks and the family constantly urged me to operate. They brought to me clippings from news-

papers describing successful operations performed on patients, and they thought that an operation must be made upon their boy. I finally consented to operate in this case, six weeks after the accident. He had an immense bedsore, and, as I said, all of the reflexes were abolished, together with trophic disturbances. He improved for about 10 days after the operation; he could move his toes somewhat,—the bladder and rectum improved a little, but that is about all the improvement he has made, and he has remained in the same condition for the last four years.

I saw another case last summer in which the patient was injured over the fourth dorsal vertebra, but there were no signs of fracture. In this case all the reflexes were abolished. I refused to operate on the ground that most of our authorities advise against operation in such cases or, at least, have had very discouraging results. He is living today with but very little improvement in his condition. I would like to ask Dr Means what he would do in these cases?

Dr Charles J. Aldrich, Cleveland: I think the Society is to be congratulated upon the paper which has just been presented, and further, medicine and surgery are to be congratulated upon the fact that the railroad surgeon has begun to realize that we can and do have cases of traumatic hysteria and traumatic neurasthenia, and to recognize the fact that these cases do not *all* recover. In all of the cases which Dr Means has recited, he mentions only two cases of malingering. That malingering occurs among these personal injury cases none can doubt, but to say that the majority of them are malingerers is a great mistake. It is easy enough for us to get together and indulge in a lot of talk about these patients recovering as soon as they get their money. Those who have followed up such cases know differently. If you will read the article by Dr Phillip Combs Knapp, of Boston, on this subject, you will change your mind. He dwells especially upon the fact that comparatively few genuine cases of traumatic neurosis absolutely and permanently recover. Because a man is able to walk on the street and do business is no sign that he has recovered. I believe that few of them entirely recover. I would like to believe otherwise, and am willing to investigate any case of genuine traumatic neurosis [illegible] a reported complete and absolutely permanent recovery. [illegible] cases will have more or less hysteria and psychic

degeneration to the end of their days. If we could go into their families, get their home life, we would find there hysteric manifestations, and psychic obliquity that is a constant torture to their families and hinderance to personal happiness.

I would like to say a word or two in reference to medullary hemorrhage or intradural hemorrhage. I recently had my attention called to this by a traumatic case. The patient and others were shifting cars with a pole when the pole flew back striking him on the chest. He sat down suddenly on the ground and at once experienced considerable pain and cramps in his legs.

Dr C. B. Parker asked me to examine him. I found him to be suffering great pain and hyperesthesia in the distribution of both external popliteal nerves. The tibialis anticus and peroneii were weakened, and a partial double foot-drop was manifest. There was no loss of sphincter power or anesthesia. Atrophy and loss of power has supervened in the muscular groups mentioned. The lesion was undoubtedly a small extravasation into the conus. Instances of such slight lesions could be multiplied. Indeed I am convinced that many of the so-called nerve injuries of the cord are due to small, perhaps punctate, hemorrhages into the spinal marrow.

Dr Brooks F. Beebe, Cincinnati: I wish to take exception, first, to the expression of applause which went up from this audience when the first case was reported as having recovered. I wish also to take exception to the lack of applause when the other patient recovered from the bullet-wound of the spine. These things simply suggested to me that we had a society of railroad surgeons rather than a State Medical Society. I wish to compliment not only the paper, which I might say does not need any compliment, and also to compliment the number of speakers who have taken the subject up so nicely and emphatically. One of the greatest mistakes which the profession made for a number of years was in pronouncing these cases malingering. It has been positively demonstrated, to my mind, that we have simply been in the dark to a great extent. It has been the custom to consider these cases as not an organic condition but rather of a much simpler state of affairs. We have used the word "functional" (a word that certainly ought not to be used) to cover up our ignorance. Because we cannot find by the

microscope these finest of molecular changes in the nervous system that does not mean that they are not there. One of the worst cases which I have ever come across was one in which there was no wound, absolutely, no shock other than the general shock to the nervous system. The patient was riding in a street-car which was coming down one of the steep hills around Cincinnati, when the shock was received. There was not even a fall, the patient standing up at the time holding on to one of the straps in the car. The shock has lasted now for three years and instead of getting better the case is growing worse. $7,500 in damages have already been recovered from the Street Railway Company. So I would say to the railroad surgeons go a little slowly.

While there may be a few cases of malingering, or of a disposition to exaggerate their conditions, I feel confident that there are many others who are never thoroughly appreciated by the physicians.

Unquestionably a lawsuit tends to prolong, as it compels the patient to think more or less constantly of his trouble. Rest, or freedom from work and worry, has much to do with the cure; and therefore time is an element in it that cannot always be controlled.

Dr W. J. Means, Columbus, closing: I am under many obligations to the last speaker, also to Drs Carpenter and Aldrich for their forcible presentation of traumatic hysteria, demonstrating that these cases are real conditions rather than functional manifestation. I did not intend to advocate in my paper that in these cases there were no positive lesions to the nerve-cells. I believe in the majority of cases there is a traumatism that is positive. If you will recall it, I only reported one case diagnosed as malingering, and only two cases which got well after settlement of damage suits. I do not believe that these two patients were malingers.

I hope the points made by Drs Carpenter and Aldrich will have weight with the members of the Society. My experience coincides with theirs that only a few of these cases recover permanently.

In reply to the question asked by Dr Stamm as to when we shall operate in injuries of the spine and upon what cases, is a pertinent one. I thought I stated my position clearly, that with our present knowledge it is quite impossible in the primary stage to differentiate between a compression of the cord producing complete paraplegia and a cross section of cord. Some surgeons think differently, but this has

been my experience. I do not believe in an early operation, especially if the injury is in the cervical region, or well up along the dorsal. I believe an operation should be deferred until the primary shock has subsided. If you will recall my statement, my cases were operated upon after the primary shock had passed away. I believe in cases of complete paraplegia that an operation should be made immediately after the primary shock has subsided. Degeneration of the nerve fibers will take place quickly, and unless relieved will not repair. I would operate upon all cases where there is some evidence of continuity of the cord, even weeks or months after the injury. In the cases mentioned by Dr Stamm I would certainly have operated.

Emphysematous Gangrene

By Martin Stamm, M. D., Fremont

Emphysematous gangrene or gaseous phlegmon is a comparatively rare affection and, though it has been observed and described centuries ago, it still engages the attention and interest of the surgeon and pathologist. It is, however, only during the last decade that its etiologic and clinical features have been made the subject of special study. Before that time such cases were mixed up with those of malignant edema. Velpeau described in 1858 gaseous abscesses of the mamma with very offensive odor, and he thought that the gas was derived from the lungs, owing to their close proximity. This opinion was, however, soon upset by Chassaignac who ascribed it to the decomposition of the milk infected by coming in contact with the baby's mouth. Some cases of purulent pleuritis with formation of gas were described by Biermer, Ducheck, Drasche, and others. Friedrich also mentions a case of pneumopericarditis. Formation of gas in the peritoneal cavity is also mentioned by Breslau and Dressler. Abscesses with spontaneous development of gas, however, are rarely mentioned in literature. Puerperal pyemia observed by Lavallée and Saexinger, a case of abscess of the liver reported by Schreiber, a phlegmon of the knee-joint by Luebke and a puer-

peral pyemic abscess by Enderle are probably all the cases published prior to 1891. About that time Levy described a case in *Zeitschrift für Chirurgie*, XXXII., 248. The patient had a gaseous abscess in the upper third of the right thigh, originating from parametritis after confinement. A small quantity of pus was preserved for bacteriologic examination. The gas was free from oxygen. Agar cultures showed a streptococcus and a bacillus resembling that of anthrax. It formed long chains and filaments, was amobile and stained readily with the usual fluids. It was not discolored by Gram's method. Levy mentioned at the same time a case, reported by Arlving (*Progrès Med.*, p. 448, December 3, 1887), of injury to the eye, in which on incision pus and very offensive gas escaped and in which the bacillus showed some resemblance to the *vibrio septicus*. It proved to be aërobic and anaërobic, and also developed gas when inoculated under the subcutaneous tissue of rats. More order and light was brought into this question by Welch and Nutall, through their publication in 1892, wherein they described the *bacillus aërogenes capsulatus*. Their observation has since been confirmed by a number of authors, and it looks as if their bacillus, as a rule, was the causative agent of the production of gas. Soon after their publication Fränkel gave an account of four cases of gaseous phlegmon, in which he described an anaërobic gas-forming bacillus which, in three cases, he found in company with other germs, chiefly the pyogenic cocci. According to his description it is a short, plump, rod with round ends. It produces gas and a penetrating odor. It is amobile, spore-formation seems to be an exception, its thickness is that of the anthrax bacillus, and it sends out filaments. Pure cultures injected into guinea-pigs produced the characteristic gas-phlegmon within twenty-four hours. Fränkel called this germ *bacillus phlegmones emphysematosæ*, and he denied its identity with that of malignant edema or of Rauschbrand. He at the same time maintained that more than one kind of bacillus can produce the clinical pic-

ture of emphysematous gangrene, but that they are all anaërobes. On this ground he recommended making large and early incisions to give free access to air, and at the same time he advised the use of oxydizing solutions, such as a solution of potassium permanganate. Margarucci mentions a case of gas-phlegmon reaching from the left thigh to the clavicle and originating from an ulcer of the bladder perforating into the sigmoid flexure. Bacteriologic examination showed a pure culture of *bacterium coli* in the cellular tissue, which would demonstrate that gas-phlegmon might also be due to that bacillus.

In 1893 interesting papers on this question were furnished by P. Ernst, Graham, Steward, and Baldwin. In 1894 Mann published from Welch's laboratory an observation of emphysematous gangrene caused by the *bacillus aërogenes capsulatus*, and in 1896 Welch and Flexner published a report of twenty-three human cases of emphysematous gangrene, including also examples of submucous gas-cysts, pneumoserositis, and a variety of other pathogenic manifestations of this gas-bacillus. In the same year Goebel published a valuable paper on foamy organs. Since that time American authors have contributed the most and the best literature on this subject, principally through the influence of Dr Welch.

The bacillus as described by Welch is a rather coarse, non-motile, anaërobic bacillus, staining also by Gram's method. It grows on all the ordinary culture-media under anaërobic conditions, best at the body temperature but also at the room temperature. Spore-formation is not constant. This bacillus, depending upon the race and the culture-medium, is capable of developing gas not only by fermentation of sugars but also from proteids. Fränkel noted the presence of spores in a few bacilli that grew in one lot of agar containing sodium formate, and Durham observed spores in blood-serum cultures, but not in other media. There is some range in variation in regard to spore formation, rapidity of liquefying gelatine, presence of capsules,

retention of Gram's stain, and virulence. Some specimens never form spores on any medium; others do so occasionally on blood-serum, mannite bouillon and on plain agar. Spores have never been found in animals inoculated with pure cultures. The gas-bacillus does not always liquefy gelatine, and if it does, as a rule, liquefaction is very slow. Some authors have not found the capsules, but Welch thinks that by suitable methods they can generally be detected. Gram's method, as a rule, stains the bacillus, but on cover-slips taken from cultures some become partly or totally decolorized. Bacilli in the tissues generally stain well by this method. Original cultures from human beings at times are of feeble growth, with little gas production, while subsequent cultures from inoculated animals are more vigorous and show the typical character. Guinea-pigs, pigeons, and sparrows rapidly succumb to inoculation from material or cultures fresh from the infected body, showing local necrosis of the tissues with abundant development of gas. The blood is not so readily invaded by the bacilli during life. There is little inflammatory reaction, a small number of leukocytes are present in the exudate, but there is more or less bloody edema. Its power of producing gas in quantities in the blood, organs, and tissues of rabbits killed a few minutes after intravenous injection serves as a fundamental test, and is a distinctive characteristic not possessed by colon bacilli. The bacillus of malignant edema is thinner than the colon bacillus, its tendency to grow into filaments is greater, it is not so readily stained by Gram's method. Spores, as a rule, develop in culture media. It is motile, liquefies gelatine more rapidly, and produces foul odor but less gas in lactose bouillon. It peptonizes clotted casein, and generates little or no gas in rabbits under conditions mentioned before.

The natural habitats of the gas bacillus are the intestinal canal and the soil, the abodes of so many anaërobic germs. Howard has demonstrated this by inoculation of animals h cultures taken in ten cases from the intestines. Walker

has found it in dust collected by sweeping floors, and Harris in the contents of an old cesspool. Welch has isolated the bacillus from a bullet removed from the head of the tibia in a case of gaseous phlegmon, and Fränkel made cultures from a splinter of wood in a case of tetanus, demonstrating thereby that the infection is due to foreign substances, especially dirt in wounds. The gas bubbles have been found a few hours after death in the blood and other organs, especially the liver, without any trace of ordinary putrefaction. At first it was thought to be due to entrance of air into the circulation until Welch demonstrated in 1891 that the *bacillus aërogenes capsulatus* was the causative agent. Welch is still unable to state whether the gas, as well as the bacilli, is present in the circulation and internal organs during life. He expresses great doubt whether gaseous phlegmon can be produced by the colon bacillus, except perhaps in diabetics; so far, at least, all his experiments and tests have a tendency to prove the contrary.

The *bacillus pseudoedematis maligni* of Sanfelicé. which is an aërobic bacillus and somewhat of the shape and size of the *bacillus coli,* however, seems to be capable of producing this affection, although it has been observed only in a few cases. Welch has collected forty-six cases of emphysematous gangrene, in which the *bacillus aërogenes* could be demonstrated, thirty-two cases are reported by American, and only fourteen by foreign observers. Out of this number thirty-five were males and ten females, which, no doubt, can be explained by the fact that injury was the principal cause of gangrene. In 18% of the cases the extremities were the seat of gangrene, the lower being twice as often affected as the upper extremities. The emphysema extended in several cases from the thigh to the abdominal walls or from the arm to the subcutaneous tissues of the shoulder and chest. In one case the abdominal wall became involved following the removal of the appendix. Another one followed an operation for strangulated Littré hernia, and one affecting the deep tissues of a

nephrectomy wound. The breast and submammary tissues were the primary seat in three cases and resulted from the infusion of salt-solution. An incision of a submaxillary abscess was also followed by emphysematous gangrene, and in a case of traumatic rupture of the rectum it traveled from the inside of the pelvis through the sciatic notch down the thigh. This gangrene can also become multiple *i. e.*, it may affect the forearm and the opposite shoulder or one thigh and both shoulders. Forty-one of the above cases were due to traumatism or operation, eighteen to compound fracture, seven to bullet and gunshot wound, three to infusion of salt-solution, two to hypodermic injection, three to ligation of the femoral artery, two to external urethrotomy, and one each to traumatic rupture of the rectum, removal of appendix, prostatic abscess following catheterization, operation for strangulated Littré hernia, incision of a foul submaxillary abscess, and nephrectomy. Of the five nontraumatic cases erysipelas was the cause in one case, two cases were apparently spontaneous gangrene, and in two cases no explanation was given as to cause.

Much laceration, crushing of tissue, and comminution of bone, also grinding of dirt, bits of clothing or foreign bodies into the wound are most likely to give rise to gaseous phlegmon. Where the vital forces are greatly depressed slight trauma, such as hypodermic injections or infusion of saline solution, may form the portal of entrance. We may have pure or mixed infection, since the gas bacillus is frequently associated with pyogenic streptococci or staphylococci or with the *bacillus coli, proteus, pyocyaneus, tetanus* or Sanfelicé's bacillus. Whether the presence of these germs has any special influence upon the course of the case is not settled so far, but pyogenic cocci may be present without producing pus or marked inflammatory reaction. Gas may appear in the tissues as early as eight hours after injury, and its amount may vary in different cases. Typical uncomplicated cases show necrosis of all the tissues, bloody infiltration or exudation of a variable amount of bloody serum, and also evidences of the mechanical action of gas in the interstices. The nuclei disappear by kariolysis, and other facts to be noted are the absence of leukocytes and of

cellular reaction. If present they are to be found some distance from the primary necrosis.

The prognosis seems to be more favorable today than before the antiseptic period. When complications are not grave and surgical measures can be promptly instituted the mortality should not be too great. The constitutional symptoms seem to be attributable to toxemia. Free incisions or amputation are the treatment promising best success. When the extremities were primarily affected amputation showed 68% of recoveries, whereas incisions without amputation gave only a result of 33 1-3%. Bloodgood thinks that amputation is not always necessary. When infection is recognized early and the destruction of tissues is not too extensive, free incisions with immediate continuous bath treatment should be tried.

It may not be out of place here to report a case which recently occurred in my practice.

James C., of Vickery, O., age about 15 years, was shot on March 13, 1902, in the right axillary region, touching the lower border of the pectoral muscle, and also the region of the axillary artery. There was considerable hemorrhage at the time. Dr Bowman, of Vickery, removed the shots and wad, and thoroughly disinfected the wound. About forty-eight hours later gangrene set in, small incisions were made over the affected parts in several places, and these gave exit to gas, which from that time bubbled up constantly. I saw him on March 16, about seventy hours after the accident, and found the arm black up to the shoulder-joint. The incisions, from which gas still worked out, were considerably enlarged. It felt like cutting into a moist rubber bag, the muscles looked white like boiled meat, and some bloody serum escaped, but no pus. The temperature was 102°, pulse 96 soft and full, and the patient felt well and had a fair appetite. He was never delirious. As there were some cyanotic spots over the region of the pectoral muscle, and also some puffy swelling over the scapula, I thought it might be better to wait a day or two longer for amputation, so that the line of demarkation would be more complete. On March 19 I saw him again, and found that gangrene had not extended any further, and that the blue

spots over the chest had disappeared. Before amputation I made some cover-slip preparations and some agar and blood-serum cultures. Gas and bloody serum still escaped, and the incised muscles looked black. As I was afraid that there might be thrombosis of the axillary vessels I ligated them near the clavicle, where I found them in a healthy condition. All the affected muscles were removed, and I found sufficient skin to cover the surface. The patient made an excellent recovery, although his temperature kept up to 101½° for three days. As I do not claim to be a bacteriologist, and the operation was made some distance from home, not all the requirements in regard to anaërobic culture and inoculation into animals could be fulfilled. Owing to pressure of business I also neglected to submit the specimens to Dr W. T. Howard, Jr., in proper time to make inoculation and anaërobic cultures. The examination was only made about six weeks after operation, and Dr Howard was kind enough to furnish the following report:

Examination of coverslip preparations from the arm and cultures from Dr Stamm's case of gas-phlegmon.

Two coverslip preparations from the incisions made in the arm before operation show numerous bacteria. (1) Large numbers of straight or slightly curved, long, stout bacilli, about some of which halos can be made out. The specimens were stained, one with methylene blue, one with gentian violet. No distinct capsules were seen. These bacilli, which occur singly, in pairs, or sometimes in groups, are of the size and appearance of the *bacillus aërogenes capsulatus*. (2) A considerable number of somewhat shorter bacilli, swollen at one end, which always shows a spore. No halo can be made out about these bacilli. They do not appear to be spore-bearing forms of the first variety described. (3) A few cocci, usually in pairs, and few leukocytes are to be seen. Coverslips from aërobic agar, potato and blood-serum cultures show, first numerous staphylococci; second, many spore-bearing bacilli, similar those described in the preparations from the arm; third,

a few long, stout, bacilli of the size of ***bacillus aërogenes capsulatus.*** These latter were probably carried over from the inoculation and do not represent growth. The long, stout bacillus with a halo and probably a capsule, found in the coverslip preparations from the arm and in small numbers in the cultures, is in all probability ***bacillus aërogenes capsulatus.*** A positive diagnosis is, of course, impossible in the absence of anaërobic cultures and animal experiments. The history of the case and the morphologic characters of this bacillus warrant one, I think, in making a diagnosis.

Conclusions: Mixed infection of the arm with staphylococci, unknown spore-bearing bacilli, and bacilli apparently identical with ***bacillus aërogenes capsulatus.***

I may add that the agar culture was not liquefied, but the blood-serum was liquefied and emitted a penetrating fetor, also a few gas bubbles.

DISCUSSION

Dr S. S. Thorne, Toledo: I would dislike to see so good a paper passed by without comment. I wish to congratulate Dr Stamm for his successful work along this line, because I believe that there is a consensus of opinion against operative procedure in these cases. In past years we came to the conclusion that if the patient died without an operation we were not to censure ourselves, because if we had made the operation he would have died the sooner. I have seen some of these cases, and have stood against operation, but now, as the doctor says, much can be said in favor of operation in suitable cases. An operation should not be made so long as the disease is in a progressive condition. After the progressive condition has passed there is a line of demarcation formed which is an evidence that repair has already begun to take place, and so I feel in such cases that an operation should be attempted. I was reading some reports from the *Deutsche Medicinische Wochenschrift,* and the consensus of opinion therein given was decidedly against operation. Of the cases reported practically every case died which had had an operation. I would like to call upon Dr Jacobson, who reported a case of this kind, with his conclusions made postmortem. I want to congratulate Dr Stamm most heart-

ily on his work along this line, for it is only in work of this nature that progress is made.

Dr Julius H. Jacobson, Toledo: I rise partly as a vindication of myself from one of the remarks which Dr Thorne has made, and partly in order that such a valuable contribution may not go by without some discussion. I have had some experience with the bacterium spoken of by Dr Stamm as I have made some experiments along this line myself. The case from which I got the cultures and made the experiments was not one where the diagnosis was arrived at at postmortem as Dr Thorne has stated, but antemortem. I did not have the fortune to have a recovery in my case such as Dr Stamm has reported, but it was one from which much could be learned. I believe that these cases occur more frequently than we would ordinarily suppose but they are not recognized. A great many of the older surgeons will remember cases of emphysematous gangrene in which the odor was said to be due to the decomposition of tissue, or the entrance of air into the tissues. We now know this to be false, that such conditions are due to the entrance of the germ erogenes capsulatus. This is a very important subject and the dissemination of the knowledge concerning it is very apt to lead to a more frequent recognition of the affection in the future.

My case occurred after a compound fracture of the forearm with rapid infection by this germ following the injury, and death ensuing later. The present consensus of opinion tends more to amputation than incision and drainage, although incision and drainage has been followed by good results.

Dr Martin Stamm, Fremont, closing: I think if I can claim any credit for the recovery of the patient it was probably due to incision rather than amputation, and I think the way in which incision was beneficial was this, *viz.*, the *bacillus erogenes capsulatus* is an anarobic bacillus and the admission of air to the muscles and tissues may have had a beneficial effect in destroying or arresting the pernicious work of the bacillus. This may have prolonged the life of the patient so we could wait for the formation of the line of demarcation. After this amputation was plainly indicated and promises a fair result. I wish to thank the gentlemen for their discussion of the paper.

A Simple Method for the Removal of External Hemorrhoids Under Local Anesthesia

By Thos. Chas. Martin, M. D., Cleveland
President of the American Proctologic Society

Operation under local anesthesia is a surgical refinement which requires of the operator the highest degree of skill. The operator whose work is uniformly painless is one who is ever attentive to the minutest detail, and, I may add, also is one who adroitly manages his patient. If there be escape of blood during the operation under infiltration-anesthesia, there can be an escape of the injected anesthetic solution, also, and consequently there will be pain. Often one sees a growth dissected away without pain being provoked, but is shocked to behold the suffering inflicted by the insertion of the sutures.

The sutures should be passed before the incision is made.

It has been my custom for the past three years to operate for external hemorrhoids, cutaneous piles, condylomas, lipomas and other nonmalignant growths at or near the external anus as follows:

Two hypodermic syringes are used. The finest needles with long oblique points are employed. A 1/10 of 1% solution of eucain is prepared in a normal salt solution, which is administered at a temperature of about 98° F.

Two syringes are employed that I may not be compelled to await the loading of the first one a second time. This serves to shorten the time required for the operation in two ways, (1) the actual time required for the loading and (2) by reason of the prompt completion of the infiltration, diffusion of the artificially induced edema is prevented.

The finer the needle the more smoothly and painlessly may it be made to enter the tissues. A 1/10 of 1% solution of eucain is, in the quantities required for the operation under consideration, practically nontoxic. It may be sterilized by boiling. A saline solution is nonirritating. A warm solution does not unpleasantly affect the patient as may a cold one.

The integument in the proposed line of incision should be rendered uniformly edematous by the injection, as also

should the tissues beneath the base of the tumor. The oblique portion of the needle's point should be laid on the part at the place first to be punctured, the integument should be drawn tense, and by a movement of the fingers, only, the needle should be pushed steadily in till its mouth is buried *in* the integument. The piston now should be pushed and a welt will be seen rising in advance of the needle's point; as this rises in advance of the needle's point, the needle (held in a direction parallel to the plane of the integument) should be advanced also; thus, save for the scarcely noticeable prick at the introduction, the injection may be made painlessly. Now, before the incision is made the sutures should be passed. Given a tumor requiring an elliptic wound, a row of continuous sutures should be placed in the infiltrated area around the growth, then cut and converted into interrupted sutures. The incision should be made and the tumor dissected away, and at once the two rows of sutures tied. In an operation done by this method there is seldom a blood-loss sufficient to stain the wound, there is practically no loss of the infiltrated solution, and consequently, the operation is painless.

DISCUSSION

Dr E. W. Mitchell, Cincinnati: I have nothing to say on the surgical aspect of the paper, but I wish to commend the use of weak solution of eucain in such operations as Dr Martin has just spoken of, as it is a safer agent than cocain. If you will follow out the minute directions which the Doctor has advocated you will get good results, but by neglecting some of them, which hight seem unnecessary, you will not obtain the end desired. I have seen this method used by the Doctor and can testify that patients felt absolutely no pain during the operation.

Dr Dice, Montpelier: It is said that the normal salt solution has the same effect as the cocain or eucain when injected in the same manner under the skin, and that operations can be performed with it the same as with these other agents. I would like to ask Dr Martin if he has had any experience with it?

Dr Thos. Chas. Martin, Cleveland, closing: In reply to the Doctor's question I would say that I have seen this fact stated, but I have never seen the salt solution used.

CHAPTER V—OBSTETRICS

Management of Pregnancy

By W. S. Philips, M. D., Belle Center

The physician who conducts a case of pregnancy to a successful termination, which, as is often the case, unaided nature is not equal to the emergency, has well earned the gratitude of one family and rendered a valuable service to the State.

For want of time, we are obliged to refer cases of pre-existing or intercurrent disease on the part of the mother to the physician in the ordinary routine of his work, and to the abdominal surgeon, confining our paper to the morbid conditions growing out of the pregnant state, which annoy and menace the life of both mother and her unborn child.

As germane to the subject, it is necessary to invite the confidence of the family in this matter of interest, in order that the physician may have his case well in hand from the beginning, as many cases terminating disastrously are due to lack of intelligent supervision, arising from want of mutual confidence. The physician who would render the best service to prospective parents should instruct his clientele as to the importance of intelligent supervision, and thereby secure their cooperation.

While pregnancy is strictly a physiologic process, human environment and habits of life render it one beset with danger to health and to life itself. When we have learned to pilot these cases to a successful issue, we are prepared to offer one of our best gifts to humanity.

Much has been written in the way of speculation with reference to stamping certain mental and moral characteristics upon the unborn child through the conduct of the expect-

ant mother during period of pregnancy. It is the belief of the writer that the inheritance of heredity is transmitted along the lines of what people are rather than what they may presume to be for a period of a few short months.

The first question to be settled in each case is whether or not pregnancy exists. An opinion is to be formed from the totality of signs and symptoms with which all are more or less familiar, but in any case of doubt, which at times occur even in the minds of the most expert, it should be remembered that error must be made on the side of safety.

In the first place it is good practice when meeting with any trouble whose origin may reasonably be referred to local causes, and which does not readily respond to hygienic and medicinal treatment, to make an examination with reference to the position of the uterus. Versions and flexions, especially when development causes impingment of the uterine wall against the osseous framework of the pelvis, gives rise to both local and general disturbance and an eventual miscarriage. When no adhesions exist these can ordinarily be remedied by reposition once or oftener if need be, maintaining in the intervals the degree of correction first gained by an easy-fitting support.

The next consideration, having especial reference to the welfare of the fetus, is the detection and correction of malpositions during the period of intrauterine life. This is an especially serious matter in the experience of the primipara during the last month of gestation if the position of the child should be oblique or transverse. When the abdominal walls are thin the malposition can frequently be detected and correction brought about by external manipulation, the correction being maintained by a snug-fitting bandage. However if the usual longitudinal position be reversed resulting in a breech presentation, detection is not so easy and correction is difficult if not impossible on account of the usually scant amniotic fluid, with consequent short lateral dimensions of the uterine body, and it is better referred to

the obstetrician well trained in the dextrous application of the forceps to the after-coming head.

The catalog of diseases effecting primarily the expectant mother and directly traceable to gestation may, as a rule, be grouped into a single class having their origin in the accumulation of effete products in the system, or, in the disturbed balance between food ingestion, quickened processes of nutrition and elimination of waste from the body.

That the nourishing of two similar lives in one body brings about any physiologic process essentially different from the ordinary, save in that of heightened activity, is incomprehensible; hence we conclude that the diseases having their origin in the pregnant state owe their existence to this circumstance. This conclusion is emphasized by the happy results of treatment based upon this view of the case. A single exception may be noted, that of nausea, which seems to be of mixed origin; first reflex, second toxic, and third a combination of the two.

The reflexes from the gravid uterus exert but a slight influence upon the other morbid states, except that of general nervousness, and which consist of neuralgias, principally headache and enteralgia, vertigo, anasarca, eclampsia, insanity, pernicious anemia, and tuberculosis. The first three mentioned are danger signals to warn the alert physician of possible disaster if unheeded, and are the lesser manifestations of toxemia, first upon the nervous system, and second upon the fluidity of the blood allowing extravasation into the lymph spaces and surrounding cellular tissue, thus relieving the blood of a certain amount of its toxicity. A coincident warning oftentimes occurs in the filtering of albumin through the overworked and irritated kidney.

While it is generally conceded that eclampsia is of toxic origin, it may also be assumed that insanity and pernicious anemia, having their origin in pregnancy, are due to the same cause, for the reason that they are prone to disappear when the period of lactation is ended and, like insanity, having its origin in other conditions, have a predilection for t

time of year when the average temperature is relatively high. In addition to an excess of chemic products, evidence is not wanting which indicates the presence of unused organic matter in the circulation which we believe forms the basis of susceptibility to tubercular infection.

In the case of the healthy pregnant woman observation reveals three of the physiologic functions noticeably altered, viz., appetite quickened, perspiration diminished and exhaled breath unusually fetid, the reason for which is obvious. In the first place the requirement for an additional food-supply by the development of a new life and the derivative effect upon the circulation due to the same cause, depleting the cutaneous vessels, renders the glandular structures of the skin functionless and forces the lungs to perform compensatory work.

That these alterations in the physiologic functions of the body in the case of pregnancy bear an important relation to the morbid states enumerated, there can be little doubt. Some people inherit the inability to eliminate the waste products formed by the processes of nutrition, while in others it is acquired by disease in early life, and any circumstance calling for an additional food-supply disturbs the normal balance between health and disease.

With this view of the etiology, it is evident that the management instituted to steer clear of these formidable complications must be dietetic, and eliminative, and has been found successful in its empiric application during the lifetime of the present generation. The first principle then to be impressed upon the mind of the expectant mother is self-mastery. Appetite whether natural or acquired is the most tyrannical master in the sphere of the moral universe, and it is a fact that civilization is exemplifying the accusation recorded against Cataline of "bowing his head like the beasts of the field in obedience to his stomach." Under no circumstance does self-control in this respect become more imperative than in pregnancy, and the physician should recognize the fact that there is a definite relation between the

amount of food ingested and the excreta thrown off, the body through the different channels of elimination, conditions of atmospheric temperature, and exercise should be taken into account, and physicians should see that the amount of food eaten is commensurate with the ability of the excretory functions to take care of the waste material. Sometimes it will be found necessary, in order to have the patient properly nourished, to keep the skin, kidneys and bowels stimulated to activity by the different agencies at our command. Within reasonable limits, the size of a babe at birth, as compared to that of its parents, bears no relation to longevity or mental and physical development in after life; and while we may admit that a bountiful menu generously partaken of three times a day or oftener, is an essential ingredient in the ability to nurture and bring forth a bouncing baby of immense avordupois, it is a fact of no special virtue other than tickling the vanity of a proud father, while piled up in the other side of the balance is discomfort and disease, lack of muscular tone, making labor tedious, injury to some of the bodily structures which the skillful hand of the surgeon can only approximate to their original integrity, anguish of soul and body and too frequently death, either before or after delivery.

The remaining perplexity with which one has to deal occasionally is reflex nausea which does not yield to dietetic or medicinal means and which has to be overcome by cervical dilation, a remedy ordinarily efficient and yet attended with grave danger to the life of the fetus. No definite rule can be laid down as to the amount of force to be applied or the extent of dilation to be made, the toleration of the tissues of the mother being variable. A safe proceeding is to begin with the smallest amount of dilation observable, using a steel dilator, increasing the amount of dilation at intervals determined by the length of time required for the disturbance occasioned thereby to subside, until the trouble disappears or until the pregnancy is terminated.

An opiate administered hypodermically is a useful adjunct, as long as any hope is entertained of preserving the life of the fetus intact.

The Management of and Preparation for the First Stage of Labor

By WILLIAM W. PENNELL, M. D., Fredericktown

The preparation for the first stage of labor antedates that event by several months when possible. Usually, in the country districts at least, the physician is not apprised of the fact that an heir is expected until some wild, stormy night an alarm is heard at the door, and a voice informs him that "The old woman is sick and we want you mighty quick!" and he has all his managing and preparing to be done in but few moments, or not at all. Fortunately, the importance of seeking salutary advice respecting the whole period of gestation is becoming more and more a matter of concern.

In all cases, and particularly where she is an old primipara in whom the parts are apt to be firm and unyielding, the exclusion from the patient's diet all articles containing much lime is insisted upon for the purpose of retarding osseous formation to the end, that the bones may offer the least possible resistance to birth. The fatty, sweet and very starchy compounds are limited so as to produce a child of moderate size—lean but healthy. Much fat and advanced bony development retard the onset of the first stage, and intensify the pains of labor, if not increasing its dangers. Large babies produce great suffering, and the size of a child determines whether it can be born dead or alive. If it is lean and healthy its world for expansion is greater after birth.

The abdomen and genital region should have a daily bath, followed by a free application of clean lard, vaseline or lanolin. This is done to keep the skin soft and pliable, the vaginal orifice easier to dilate and to prevent the unsightly checking or scarring from distension. Frequent bathing of the whole body is, of course, not to be neglected.

The patient should have regular exercise, eat abundantly of fruits and vegetables with some lean meats, preferably

well-cured ham and fish. It isn't best to try to satisfy the longings of a depraved appetite which is but an evidence of some ailment and of which the attendant should seek out and remove the cause. It is not enough that she does her household duties for exercise, but should seek refreshment and exhilaration out of doors at seasonable times, avoiding all sorts of violent exertion. Carriage drives, cheerful surroundings, not omitting reading and other mental occupations, and all such environments as produce health of body and peace of mind, should be hers. In a word, the home-life should be bent to the one object of assisting the expectant mother to bring forth, as easily and speedily as possible, a healthy infant, physically and mentally.

The bowels should be regular throughout the whole period of gestation. If constipation exists its remedy lies in a relaxing diet and adoption of regular habits, resorting to aperients only when demanded. The urine should be tested at frequent intervals for albumin and casts, if there should be headache, particularly if the headache and edema are associated.

Corsets should be avoided, especially in the latter months, the clothing being supported by straps from the shoulders, care being taken to keep the lower limbs warm and the whole body comfortable.

In the primipara the preparation of the nipples for nursing purposes should not be neglected. Pulling by the fingers or suction by the breast pump to lengthen them, and the application of an astringent wash or lotion to avoid excoriations and fissures later on are never to be omitted. Infection with mammary abscess may thereby be averted.

With the approach of labor a laxative, consisting of such an agent as is best borne and usually taken by the patient, is administered and its action assisted by enemas of warm water and common salt, so as to clear the lower bowel of any accumulation; and if for any reason the urinary bladder is not completely emptied, a catheter is employed.

The preparation of the bed is supervised, though the

patient is not placed thereon until just previous to the rupture of the sac unless her condition requires. Her body, her clothing and her bedding are scrupulously clean, but no vaginal antiseptic or other washes are employed except in cases where a specific disease is present, or a strong presumption of it.

She is allowed the freedom of a room which is as cheerfully located as may be and which has a temperature of 65° or 70°; here she rests where she will while dilating pains are preparing her for the next stage.

The bed is by choice a firm mattress, easy of access from either side. Rubber sheeting or oil-cloth is laid over the lower two-thirds of a thick quilt placed next the mattress, and over the rubber an ordinary sheet which should be made fast to the mattress bv safety-pins. When possible, over these is laid another rubber covering and upon this another cotton sheet upon which is placed a thick pad, or several smaller pads, made from clean, folded materials, to be arranged under the patient's hips to receive discharges during labor, so that when the act is completed the upper sheets and pads may be removed, leaving the patient upon the dry first sheet. When not, the pads are used without the second rubber covering.

The patient is prepared for the bed by removing her day garments and putting on an under-vest and night-gown, and a light skirt to cover the lower part of the body and limbs. On getting into bed the night-gown is rolled up out of the way to prevent soiling, the skirt being removed with the other soiled articles at the completion of labor.

If dilation proceeds normally, it is left to the efforts of nature; but when the uterine mouth is firm, retarding dilation, a full dose of morphin is administered, and, when the effect of the drug is procured, dilation is assisted by the finger.

When dilation is far enough advanced the presentation and position of the child is ascertained, and such adjustments are made as are demanded and feasible.

Anesthetics in Labor

By Frank D. Bain, Kenton.

The subject assigned to me for this symposium, "Anesthetics in Labor," is certainly a very practical one. There is not a practician present who has not had frequent occasion to study this subject. It is a subject on which none of us have spent too much time, but with a majority of my hearers, nothing that I might say in the time allotted to me would have but little effect in changing their long-continued practice.

The few thoughts that I present to you will be preceded by a short historic sketch of the stormy introduction of anesthesia in labor, and to me the study of the history of "Anesthesia" as applied to this branch of medicine has been both an interesting and instructive one.

The exhibition of drugs for the relief of the pangs of child-birth has finally brought the science, or rather the art, into the best repute and is one in which we all have been intensely interested. It is surprising to learn how fascinated some of the early masters became over the introduction of anesthetics in obstetrics, and from being conservative they became bold and almost reckless in the use of anesthesia. We know the history of surgical anesthesia, and it was but a step to the artificial sleep of obstetric work. To Sir James Y. Simpson, of Edinburg, Scotland, belongs the credit of first administering an anesthetic in child-birth. The first successful case in which the mother and the child were both saved took place in Edinburg, February 3, 1847.

Who among us, would not have been thrilled with delight and thankfulness to have stood in the place of Simpson; to have seen for the first time the awful pains of labor brought under the magic spell of the anesthetic. In that day there were few who would have been as intrepid as was that great Scotchman who first took the immense risk,

From the above date the cases reported in the countries of England, Scotland and France were numerous. It was on February 10, 1847, that Simpson laid this subject at some length before the Obstetrical Society of his own city, and presented the lessons derived from his experience, and to show you how clear and concise were his first utterances upon this most important discovery, I here produce his conclusions:

First: That the inhalation of ether procured for the patient a more or less perfect immunity from conscious pain and suffering attendant upon labor.

Second: That it did not diminish the strength or regularity of the contraction of the uterus.

Third: That on the other hand, it apparently (more especially when combined with ergot) sometimes increased them in severity and number.

Fourth: That the contractions of the uterus after delivery seemed perfect and healthy when it was administered.

Fifth: That its employment might not save only the mother from more pain in the last stage of labor, but its use might probably save her also in some degree from the occurrences and consequences of the nervous shock attendant upon delivery and thereby reduce the danger and fatality of childbed.

Sixth: The exhibition of anesthesia did not seem to be injurious to the child.

The gist of these conclusions of this distinguished writer lies in the second proposition, that the contraction of the uterus was not diminished by the exhibition of the anesthetic and also that no deleterious influence was exerted by the anesthetic.

Ether was the anesthetic first employed, in 1847, and after a few months chloroform was employed by the same surgeon in obstetrics. Almost immediately, for various reasons, chloroform became largely the anesthetic employed, notwithstanding the dangerous symptoms that were occasionally shown by its use.

The third period in the history of this subject comprises the active contest to the application of an anesthetic in normal labor. Those of you who have been interested in this subject know what a long and bitter controversy was awakened in the profession at home and abroad, and the storm of hostility that was aroused by the persistent efforts of the ultra-enthusiasts over the introduction of chloroform in normal labor. Upon the one side was the firm conviction of right and a noble impulse to benefit humanity; upon the other a caution, a wholesome fear of interference with a natural process, and a dread of powerful medical agents unless life was in danger. Let it be remembered though that during all this controversy there was a singular unanimity in regard to the use of anesthetics in all cases of obstetrics requiring surgical interference, no discordant note was heard.

Those who opposed the exhibition of chloroform in normal labor advanced the theory that the mother, not having suffered in giving birth to her child, the maternal instincts would be lessened or abolished; that the practice was immoral; that etherization was similar to intoxication and there was drunkenness; that the pains of childbirth were physiologic in character and soon recovered from; that there had been an increase in the mortality in the cases of labor where anesthesia was given; finally, and more potent an influence probably than all the others, it was charged that anesthesia was a sacrilegious attempt to set aside the decrees of Providence; and that it was an impious interference with the awful majesty of divine justice which had sentenced woman to suffer the pangs of childbirth.

No one will doubt that the administration of anesthesia in normal labor was a wonderful innovation and did great violence to long-cherished opinions. Though those brilliant medical minds who had been first to administer anesthetics in labor were not dismayed at their arraignment by their more conservative brethren, but of all the obstetricians of that day who believed in the use of anesthetics, none wrote more effectively of the good effects of its use than did Sir James

Y. Simpson, who had thus far fought the battle almost single-handed. He was ingenious in argument, apt in illustration and beyond question a lover of controversy. He showed from medical history the opposition to other medical advances, such as the discovery of the blood, of vaccination, and of the fatal effects of pain *per se* when long continued; he was ably sustained by strong men in our own land. The name of Channing was a tower of strength to the advocates of anesthesia in normal labor, and his classic work, which was published in 1848, placed its author in the same class with Simpson. No one circumstance had such a world-wide effect upon this famous discussion of the use of anesthesia in normal labor as the acceptance of it in 1853 by the Queen of England, who permitted her attending physicians to use chloroform in her seventh confinement. The eminent success attendant upon this proved a great incentive throughout England, and indeed all Europe was ready to receive the great boon.

The administration of anesthesia in obstetrics may be divided into two classes—that of the exhibition of it in difficult labor, involving turning and forceps delivery—and in the use of it in normal labor. No one here will for a moment question its efficiency or its usefulness in the first class, but in the second class—that of anesthesia in normal labor without any complications—I think many seriously question its usefulness in the first stage of labor. Some very excellent practicians, however, make use of it in cases where a rigid os is encountered; but my practice is to wait, or give a full dose of hydrate of chloral, which usually answers all purposes.

In the second stage, where the pains are strong and the patient possibly weak from the protracted labor, it is my custom to give chloroform intermittently until the head is born, believing that many lacerations of the perineum are prevented by the exhibition of an anesthetic in this stage. This is not the time to discuss with you the choice of anesthetics, for we will all concede that chloroform is pre-

eminently the anesthetic to use unless there are contra-indications for not using it. The danger of anesthesia in labor is very greatly diminished by the intelligent administration of the same. The giving of it during pain only renders the danger almost *nil,* and gives to the patient exhilaration as well as relief from immediate pain. To hold a patient in a state of analgesia is a difficult and delicate task, requiring the closest watch and constant attention.

The late Prof W. T. Lusk is very happy in his remarks bearing upon this. He says, speaking of the more general use of anesthesia in labor: "That the hesitancy is in a measure due to the fact that few practitioners give themselves the trouble to master the necessary *modus operandi,* to study the limitations of their usefulness, or to learn the conditions of their safe administration." The same author also says: "It should be steadfastly borne in mind that the giving of anesthetics in labor is an art to be acquired, a very simple one perhaps, but the practice of which admits of neither ignorance nor carelessness." These words are full of meaning to all of us and should be earnestly considered in this discussion.

In closing this paper, the central thought I wish to leave with you is embodied in the words just quoted, together with the following: the indications for administering the anesthetic, when to give it and the degree to which it can be given with safety to the patient in normal labor, with a thought always for the safety of the mother and the child.

When to Use the Forceps

By Frank S. Clark, A. M., M. D., Cleveland

The time-limit of ten minutes makes it impossible to enter very fully into the discussion of the subject assigned me. My presentation of it will be more from a practical than theoretic standpoint. As we are more frequently confronted with the need of choosing between forceps and version than

the major operations, this will receive more attention than the wording of the subject may seem to justify.

It is a wise obstetric aphorism which says, "Wait till you see what Nature can effect—not what she can endure," but unfortunately this is too often forgotten. The gynecologist will tell how often he must operate because of the injudicious or unskillful use of forceps, for it is an instrument that, while it can save many lives and stop untold suffering, is in the hands of many most destructive.

To answer the question, asked by the title of this paper, in the negative, the forceps should never be used till the membranes are broken, a self-evident truth not necessary to state if such attempts had not been made in the past. The os must be dilated or easily dilatable and the head engaged. To these two conditions there are occasionally justifiable exceptions which will be referred to later. If the child is dead, forceps should not be used unless the head is low down and can be easily delivered. Perforation alone is justifiable in difficult cases under such circumstances. Forceps are never justifiable to save the time of a physician.

To answer the question in the affirmative, forceps should be used whenever the life of either mother or child or both is endangered. On the part of the mother this may be sudden or gradual, resulting from hemorrhage, eclampsia, a debilitated condition from acute or chronic disease, or simply from a too-prolonged labor. On the part of the child a weakening pulse and prolapsed cord require interference.

Before taking up the more generally recognized causes for using forceps, I wish to refer to the indications for forceps seen in the character of the fetal heart, which is so frequently disregarded. I doubt not that the life of many a stillborn child could be saved by an earlier application of forceps, if during the progress of labor close attention had been given to this indication of danger. Seldom have I found, when asked to see a case in consultation, that the fetal heart has been systematically examined or

examined at all, and I wish to state most emphatically that greater consideration must be given the child. The remark "never mind the child, if only you save the mother" is too common and too generally followed. It is well enough perhaps if there is a certainty that one or the other must be sacrificed. Such a choice will rarely be needed, however, if our cases are studied with the purpose of doing the best possible for each. By noting the rate of the fetal heart at the beginning of labor there will be no difficulty in recognizing an increasing or decreasing rate as labor advances. When this change is taking place we should use forceps to save the child's life, even at the risk of a lacerated perineum or cervix. An intelligent application of forceps will seldom cause any serious injury to the child, and whatever danger there is is usually less than from the compression of the brain in a long severe labor, a compression which so often leads to birth-paralysis or death. The almost tetanic contractions of the uterus, which are sometimes seen, may result in asphyxia of the child because of the continuous compression of the placenta. If the child is suffering from the effects of such compression, it will be seen in the character of the heart-beat, thus giving a positive indication for the use of forceps.

In cases in which after the os is dilated the membranes break, bringing down the cord, and the head immediately passes into the cavity of the pelvis, forceps should be used without a moment's delay. If the os is not fully dilated and the cord comes down and cannot be replaced, version should be the choice instead of forceps.

I wish now to take up more in detail the indications for forceps as they exist in the mother. As already said, the use of forceps before the completion of the first stage should only be in exceptional cases, in which the life of the mother or child is in danger. A slow dilation of the os is usually due to one of the following causes, too early rupture of the membranes, malpresentation, shortening of the diameters of the pelvis or increase of those of the child's head,

and insufficient pains. It is very important that it be understood which of these is the cause of delay, and that proper means be used to remedy it if possible instead of an indiscriminate use of forceps. If the condition of the patient will not allow delay and the means used fail, forceps are often indicated, the os being dilated manually or by making traction with the forceps. Traction should not be made when the uterus is contracted and the os rigid, but between contractions when the cervix is soft and more yielding, decreasing the liability of laceration. Just when it will be time to apply forceps cannot be definitely stated, for each case must be considered by itself according to the conditions existing.

It is in the second stage of labor that we have the most frequent causes for the use of forceps. These are usually a disproportion between the child and birth-canal or some abnormality in the mechanism of labor, such as a failure of the head to descend and rotate, a rotation of the occiput into the hollow of the sacrum, a brow or face presentation (except mentoposterior positions), and an aftercoming head when ordinary methods of delivery fail. In all of these the general condition of mother and child and the condition of the birth-canal and presenting part must be considered in deciding the time for using instruments. If during hard pains the head remains stationary, there should be but little delay, because of the danger to the soft parts of the birth-canal. If there is a receding of the head after each pain, even if there is no real advance, there can be a longer delay which will give more perfect moulding of the head and correspondingly better results in delivery. This delay can vary from half an hour to two or three hours according to the above conditions. General exhaustion from these causes must be distinguished from true uterine inertia which also requires the use of forceps, yet they must not be used when the relaxation is complete, for emptying the uterus at such a time will probably be followed by serious hemorrhage.

The conditions which, perhaps, require the most skill

and experience in deciding not only when to interfere but the nature of the interference are seen in those cases in which there is a disproportion between the child's head and the birth-canal, either because of an abnormally large head or on account of a small pelvis. Unfortunately we still have no exact method of determining the size of the child's head, though by making pressure downward on the fundus of the uterus or from above the pubes a fair idea of whether the head will enter the brim can be obtained. A careful measurement of the pelvis, which should always be made, will determine whether it is at fault, but to say that a certain measurement must be the standard by which we decide that this or that operation is indicated would surely pave the way for very embarrassing results for many who tried to follow the rule.

There is a wide variation in the measurements, as given by different obstetricians, at which forceps can or should be used. Some say as low as 8 c. m. or 3 inches is safe, others put the limit at 9.5 c. m. or 3¾ inches. What is right, however, in one case, may be wrong in another, so that valuable as these measurements may be they must not be considered as our only guide except in conjunction with the other conditions which exist. The firmness of the child's head and the extent to which it can be moulded; the rigidity of the parts making up the birth-canal; the possibility of a gain being obtained for the true conjugate from Walcher's position are some of the conditions that must be considered when deciding whether this or that conjugate shall be considered too small or not. In many of these cases if sufficient time is given the head will mould so that it can enter the brim, making a forceps operation not only possible, but strongly indicated when it might otherwise seem a questionable procedure. In cases in which the head does not enter the brim, when moulding is slow or does not occur, when the true conjugate is not under 8 c. m., we are confronted with the alternative of version. That in a certain case conditions might require symphysiotomy or

Cesarian section, instead of forceps or version, I do not deny, but they do not come within the province of this paper. If version is to be chosen, all conditions favorable to a successful result must be present, that is the membranes must be unruptured or but recently ruptured, there must be absence of tetanic contractions of the uterus, and there must not be elongation of the lower uterine segment. We must remember that in an ordinary breech presentation, when conditions are favorable, there is a marked increase in infantile mortality over vertex-presentation. In version this is much greater, for we disturb the relations of the arms of the child with the danger of their extending along the sides of the head delaying the delivery, we are forced to use strong traction to draw the head into the brim putting a great strain on the neck with its attendant dangers, and in performing version the hand must be introduced into the uterus, increasing the dangers of infection. On the other hand, in the use of forceps when the head is not fixed in the brim, there is not the need of rapid delivery as in version, and so there is not the sudden compression of the head, as in version, which may be serious to the child. In a normal labor the moulding of the head is often very marked and the compression very severe, but it is so gradual that there are no serious effects if they are not allowed to last too long. Forceps delivery cannot be as gradual as this but it can be deliberate enough in most cases to imitate somewhat normal labor in this respect and to avoid the injuries of rapid compression which cannot be the case in version. I do not underestimate the dangers of high forceps. I also realize that some may take issue with me on this matter, but I believe that with the proper forceps and skill many more cases can be safely delivered than by version. Those who do much consultation work will, I believe, agree with me that, in many cases in which someone else has failed to deliver, it was because of a lack in just these two particulars. This is especially true in high forceps operations. With ordinary forceps it is usually difficult to make traction

in the right axis, no matter how skillful the operator. The Tarnier axis-traction forceps are the proper forceps in these cases, and with them delivery is much simplified, traction is made in the right direction (consequently less is needed) and compression of the child's head and the danger to the mother are much lessened. For these reasons I advocate forceps instead of version, and I believe they will give the best results.

In just a word then I would say that if no sudden emergency has arisen demanding instant action, the character of the fetal heart and the mother's general condition should guide us in deciding when to use forceps. If there is an abnormality in the mechanism of labor, and the head fails to advance beyond a certain point, we should not delay. If the head is at the brim, we should wait for the os to dilate, if possible, certainly as long as the membranes are unruptured, and we should wait for the head to mould if it will and then use the axis-traction forceps. Each case must be studied for itself, yet we will find that usually in doubtful cases the danger of interference is less than that of leaving the patient alone.

DISCUSSION

Dr J. A. Wright, Toledo: It was not my intention to speak on this subject, but I do not like either to see the time of the Society wasted or essays of the value and interest of those submitted passed without comment. The subject of obstetrics is a very large one, and it can scarcely be covered with any degree of justice in a 10 minutes' discussion, or even in a symposium of papers such as we have just listened to. I wish particularly to endorse the most excellent paper presented by Dr Bain on "Anesthetics." There is, however, one point on which I would like to take issue with him in a measure, and that is in regard to the use of anesthetics during the first stage of labor. It seems to me that if there is anything which can add to the strength of the patient, and support her during this period and at the same time give her a fair degree of relief, it is not chloroform or ether, but opium. I believe that point has been very well brought out by Dr Caseaux, who speaks of opium as being "the con-

servator of uterine dynamics" and who says that it is especially valuable and serviceable during the first stage of labor, because it relieves excess of suffering without causing prostration. It has been my practice for many years to give anesthetics (and by that I mean chloroform) from the beginning of the second stage of labor until the termination of that stage, but I believe it is scarcely ever justifiable to employ an anesthetic during a prolonged and tedious first stage. Of course such cases need relief, and in the use of opium the progress of the labor, instead of being interfered with, is actually encouraged, while the strength of the patient is conserved.

In reference to the position taken by the last essayist concerning the use of forceps, I would say in my experience (and of course that is quite limited) I have very seldom had occasion, indeed, so far as my memory serves me, no occasion to use forceps during the first stage of labor, and with an os uteri undilated or undilatable it is, in fact, almost impossible to consider anything like using forceps. It is as a rule safe, therefore, in cases of that kind, unless contingencies arise which do not suggest themselves to me now, to wait and allow labor to progress to such a degree that it will be safe to apply the instruments.

CHAPTER VI—OPHTHALMOLOGY

Neuroparalitic Keratitis

By THOS. F. KELLER, M. S., M. D., Toledo

The gravity of neuroparalitic keratitis is apparent to all experienced ophthalmic surgeons, and in passing I wish to preclude any apprehension that something new is being photographed upon the canvas of histologic research which is not known to the liturgy of the profession.

While the management was somewhat unique when compared with the teachings of some of our ablest ophthalmologists like Graefe, Hutchinson, Gudden, Magendie, Fuchs, Leber, Hippel, Ebert, Böckman and others, no preeminence is claimed in accomplishing the desired result, as the same etiologic conditions would have appealed to any student of pathology.

If by giving a brief synopsis of this one particular case, which came under my observation within the last year, should interest anyone engaged in the healing art, then the object of this paper will have accomplished its purpose.

Charles R., American, aged 26 years, a farmer by occupation, applied for relief August 10, 1901, macroscopic examination revealed a cloudiness in the center of the cornea of the left eye and the absence of sensibility and lacrimal secretion led me to suspect trophic and latent physiologic disturbances. The patient admitted having contracted syphilis in January of the same year, with the accompanying initial sclerosis in the months of March and April.

Nothing unusual occurred (save an occasional attack of diplopia and vertigo) from this time until August 7, when he was kicked by a colt on the left temple, rendering him unconscious for several minutes, resulting in an ecchymosed

condition of the eye and seat of injury. Having a specific and traumatic history of his maladies, as well as a dull surface of the cornea, which indicated a recent affection, I concluded to resort to heroic prophylactic treatment with a hope of arresting any further destruction of the epithelium of the cornea, especially if the paralysis of the trigeminus was secondary to a lesion at the nucleus or origin in the brain, hastened possibly by the trauma inflicted.

Having good digestion, and never addicted to the use or abuse of liquors, he began taking 15 drops of saturated solution of iodid of kalium in compound syrup of cinchona and milk immediately after eating, increasing the amount six drops daily, until he was taking 120 grains a day. This maximum amount was decreased in the same relative proportion as it was increased, and continued in this way for a period of three months.

I also gave him daily hypodermic injections of bichlorid solution into the gluteal muscles for 90 days, at which time lacrimation and sensibility of the eye fully reestablished themselves. Subconjunctival injections of corrosive sublimate, 1-5000, was resorted to every second or third day, until the blood-vessels began forming around the limbus nearest the ulcer.

The eye was constantly protected from the elements with a perforated shield, and the ball was kept moist and as aseptic as possible with a mild solution of boracic acid. Hot compresses and a solution of atropin completed the therapeutic measures.

The result from this form of treatment was a retention of the contour of the cornea, a translucid opacity in the center of the eye of two and one-half m.m. in diameter, and a complete restoration of all the physiologic and anatomic functions of the eye, save the one specified exception.

Neuroparalitic keratitis is sometimes confounded with two other forms of keratitis, viz., lagophthalmia and keratoalacia,

If you will permit me to digress for a moment, I will try to point out the principal diagnostic symptoms, differentiating one from the other.

In lagophthalmic keratitis, the cornea becomes dessicated, owing to an inability to close the lids, due to protrusion of the ball, contraction of the lids, or paralysis of the orbicularis palpebrarum muscle, and the ulcers are usually on the lower quadrant or limbus of the cornea, as this part is exposed most of the time during the day, as well as at night, for the eye is always turned upwards during sleep.

In keratomalacia, our attention is directed to a whitish substance like deposit on the conjunctiva on each side of the cornea, which cannot be moistened with lacrimal fluid, and has the appearance of being touched with some unctious preparation.

Again, this form of keratitis exists only in impoverished and illy-nourished children, and never was known to occur in adults. Many other symptoms might be given in describing the various features which are not common one with the other, but I hope sufficient stress has been given on the essential points to aid one and all in making a diagnosis of this, one of the gravest forms of keratitis.

DISCUSSION

Dr J. H. McCassy, Dayton: Along about November, 1899, a patient came to me at Dayton. He was a man aged 82 years, suffering with an epithelial cancer of the face, located on the right side between the eye and the ear. He was unable to close his right eyelid, there was a paralysis of the right side of the face, and he had an ulcer of the cornea extending toward the edge. This was a case of neuroparalytic keratitis due to an involvement of the trigeminus nerve. The facial nerve was also affected, which, together with the involvement of the trigeminus, produced a complete facial paralysis. The trigeminus is, as you know, a nerve of special sense of motion and common sensation. The eye also lacked lacrimation and sensitiveness, which are always present in a paralysis of this nerve. I think that in the case recited by

the doctor the kick of the horse was the cause of the paralysis of the nerve, and not the syphilis.

Of course the treatment of my case did not amount to much. A simple antiseptic, boracic acid with hot compresses and some atropin were used. The process of ulceration on the cornea was arrested in about eight weeks, but the patient died in about two months afterward from the general cancerous condition of the face.

CHAPTER VII—NEUROLOGY

Puerperal and Gestational Paralyses

By CHARLES J. ALDRICH, M. D., Cleveland

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Various forms of paralysis may appear during gestation or complicate any part of the puerperal period. Writers have usually described these nervous affections as puerperal. It is obvious, however, both for convenience and accuracy, that they should be considered apart. Hence in the following discussion all paralyses occurring in the gestational period will be called *gestational paralyses;* and all appearing during labor or the lying-in period, *puerperal paralyses.* Hysteric paralysis may occur in any form, and at any time during gestation or the puerperium, but will not be considered in this connection.

CENTRAL PARALYSES (GESTATIONAL)

Gestational paralysis may be due either to a central or a peripheral lesion. Hemiplegia from central lesion is rather common in pregnancy; it may be the result of a cerebral hemorrhage, or less commonly from embolism; it is also said to rarely occur from cerebral anemia. In grave renal lesions complicating pregnancy, uremia has been known to produce cerebral paralysis without discernable lesion. Cerebral monoplegias have been reported, but are rare indeed.

Paraplegia of spinal origin may also complicate gesta-

tion; literature shows, however, that its occurrence is extremely infrequent.

PERIPHERAL PARALYSES (GESTATIONAL)

Peripheral paralyses occurring during pregnancy, are neural in origin and are either *toxic* or *traumatic*.

The *toxic* varieties of gestational neuritis usually appear in women who have come to confinement weakened and cachectic from some unusual drain upon nutrition, most frequently from prolonged and intractable vomiting.

The following report is typical of this form of neuritis. The case was exhibited to the Cuyahoga County Medical Society but a short time since:

Mrs F. K., aged 27, is a widow with three healthy children, the eldest of which is six years, and the youngest about 10 months. She has not been very strong since her marriage. She has never lost any children nor has she had any miscarriages. Her husband died on September 16, 1901, of acute tuberculosis. Careful examination reveals neither pulmonary nor cardiac disease in our patient.

During all of her pregnancies she has been very sick at the stomach and vomited continually from the second month until her accouchment. During the latter months of her pregnancy she suffered from considerable swelling and much pain in her legs, and states that they felt numb, powerless and heavy; her arms, however, were strong. This weakness, powerlessness, and numb feeling in her legs became more marked just previous to her delivery. Immediately after the birth of the child her legs became very painful and tender to touch. After the usual stay in bed she attempted to get up, but found that although the swelling had disappeared, the legs were weak and numb. This weakness and numbness was particularly marked in the right leg. She now states that when she attempts to go upstairs her feet feel heavy, and if she does not watch where she is going her toes catch in the carpet. Her legs are so eak and her ataxia so great that she cannot go upstairs less there is a baluster for support, nor can she walk in

the dark. She is not constipated and her sphincters are intact. She has no headache or backache, nor any affection except her inability to walk and the numbness in her feet and legs.

EXAMINATION

She is intelligent, of medium height, and thin to emaciation. The heart, lungs, abdominal and pelvic organs appear normal. There are no ocular affections nor any weakness or paralysis of any muscle or group of muscles in the face or upper extremities. Tendon reflexes in the upper extremities are quite indistinct. The tongue is protruded straight, the labionasal fold is deepest on the right side. The left pupil is larger than the right, and both react promptly to light and accommodation; the palpebral appertures are equal; the disks and fields are normal, but a fine lateral nystagmus is present.

She walks with a distinctly ataxic gait, and marked footdrop is present on the right side. She cannot stand with her eyes closed, in fact she stands poorly with them open. Both knee jerks are absent, front tap, and Achilles' jerk are also absent; plantar reflexes are absent; gluteal and abdominal reflexes are present. A well-defined anesthesia of the sole of the right foot and toes is demonstrable. There appears to be a distinct atrophy of the intrinsic muscles of the feet which is most noticeable in the right foot, and there is evidently some atrophy of the anterior tibial and peroneal groups, most marked, however, on the right side.

Her sense of localization is not good. She thinks I am touching the great toe, when, in fact, I am extending the foot strongly. On the anterior aspect of the left tibia there is considerable periosteal thickening which looks very much like a specific periostitis, although all other evidences and history of specific disease are entirely wanting.

Vinay[1] has reported a very similar case which is well worthy of brief abstract:

During the first months of pregnancy the patient lost a great deal of blood, and during the latter months suffered

from hyperemesis, so that she came to confinement in a cachectic state. During the last two months of pregnancy she complained of paresthesias of the extremities, and of pains and weakness in the legs. On the third day after delivery she had a chill with fever which lasted only 48 hours; on the fourth day she noticed that there was marked loss of power in all the extremities. This rapidly increased until she was almost completely paralyzed. About six weeks after confinement she began to improve and four months from that time had fully recovered.

In some of these forms of neuritis it has been assumed, and with good reason, that circulating in the mother's blood is some unknown toxic agent which has a selective affinity for the peripheral nerves.

That something besides a cachexia or nutritional failure exists which conduces to the production of gestational neuritis, the two cases reported by Elder[2] appear to be conclusive. Both women were normal, neither being cachectic, anemic nor exhausted. In each the symptoms appeared at about the sixth month, and consisted of tingling and paresthesia, chiefly in the hands, but in one of the cases it was also in the feet. Sensation in both cases was lessened to some extent, but there was little or no muscular paralysis. All other known causes of neuritis could be excluded. After delivery recovery immediately began and proceeded rapidly; one recovered in four or five weeks, and the other in about four months. Elder takes the absence of hyperemesis, weakness and cachexia, which are usual characteristics in most cases of gestational neuritis, as evidence that they are not necessarily concomitants, but expresses the opinion, which I believe to be well-founded, that some toxin is elaborated within the body of the mother or child which has a selective toxic effect upon the nerve tissues of the pregnant woman. Windscheit[3] states that the etiology of these are cases is unknown, but are supposed to be due to the tion of some poison circulating in the blood. The clinical ture is usually that of a pure form of motor neuritis. No

special nerve seems to be selected. Usually there is a gradual development of the motor weakness of the extremities, pain is infrequently complained of, but slight sensory changes may be present. The muscles usually atrophy and show the reaction of degeneration. Other trophic changes have been observed to occur.

Solowjeff[4] and Polk[5] have reported fatal cases of peripheral neuritis occurring in pregnancy, and since most of these cases quickly recover when the uterus is emptied one should be prepared to induce labor if there be indications of progressive and violent neural inflammation. Eulenberg induced labor in his most severe case in order to save life.

The following personal observation possesses features varying so much from the preceding cases, but strong with suggestions of a cause similar to that which Elder assumes in his cases, that a brief abstract will be of value:

Mrs F., aged 36, with a good family history, has one daughter 17 years of age. She became pregnant in the early part of 1892. She worried very much about her condition and became quite melancholic over the fact that she should have another child when she had a daughter nearly grown up, and that it would also prevent her from attending the World's Fair at Chicago. She visited the Fair while she was in her seventh month and while there noticed a beginning weakness and numbness of the legs. This grew worse until she was able to be on her feet only a part of the day. She returned home and was confined nearly three weeks before her expected time. Her labor and puerperium were normal. The weakness increased in her lower extremities and was accompanied by some slight loss of sensation, considerable of aching pains, and a very marked amount of ataxia. All of her symptoms were distinctly those of a neuritis. Dr J. H. Lowman concurred in the diagnosis of a gestational neuritis. She made a partial recovery, but still suffers some weakness and ataxia.

Since this form of neural inflammation usually terminates at birth, is it not possible that we have some

toxemia as a result of the metabolic changes incident to the relations existing between mother and unborn child? Is it not possible that the neuritis is a direct result of poisoning from the blood laden with effete matter from the failure of the established ratio between production and elimination of the poisonous emanations of the two individual organisms?

Study of the literature of gestational and puerperal neuritis shows that many of the reported cases beginning during gestation and become complete only after labor—truly gestational but entitled to be considered as transitional forms.

TRAUMATIC NEURITIS ((GESTATIONAL)

Traumatic gestational neuritis has been assumed to exist by some authorities, and examination of the literature seems to afford grounds for their claims. In placing it in this classification I wish to state the belief that some of these cases are ischemic paralyses due to the pressure of the fetal parts upon the vessels of the mother, or a pressure-neuritis caused by an edema of the nerve sheaths produced by disturbance of the pelvic circulation.

It is a well-recognized fact that a mixed nerve may temporarily lose its power to conduct motor impulses from having its nutrition disturbed by any cause which either deprives it of blood or unduly congests its delicate elements. The same effect may supervene from the elastic and slowly developed pressure of exudations into contiguous tissues or even into the nerve sheath, or from simple elongation of the nerve by stretching. If, however, the pressure remains too long or becomes too great, or the enemia or congestion continues too long, inflammation and degeneration of the nervous tissues will occur with final involvement of the sensory power of the nerves, and a paralysis of more permanent character supervene.

Since the days of Albrecht Von Haller[6] it has been own that the interruption of the blood-supply of the lower remities would cause them to become paralyzed and

stiff. Later the great Volkmann[7] called the attention of the surgeons of the world to the fact that rigidity and stiffness with contracture of the muscles not infrequently followed too tight bandaging, and conclusively demonstrated that it was not pressure upon the nerve-trunks, but the direct result of interference with the blood-supply that produces what is now called ischemic paralysis.

It is the belief of the writer that some of the transient paralyses which have been noted to complicate gestation and to follow labor, and have been formerly ascribed to reflex, dynamic and other fanciful causes, were due to an ischemic paralysis which was produced by interference with the circulation from too long lodgment of the head in the inferior straight, the pelvis being either too small, misshapen, or containing a head whose proportions were too great, particularly in certain diameters, or perhaps the gravid uterus exerted too much pressure upon the large arterial trunks above the brim of the pelvis, or upon arteries pursuing an unusual and anomalous course.

This view will probably explain some of the accounts of transient paraplegias which followed labor and recovered in two or three days. The disturbed circulation of the lower limbs incident to pregnancy is more likely the cause of the muscular cramps which precede and accompany labor than pressure upon the nerves, since it is a well-recognized fact that the portion of the sacral plexus which goes to the formation of the external popliteal or peroneal nerve is more likely to be affected than the nerve-supply of the calf muscles, which are well-known to be most frequently the seat of cramps both before and during labor.

It is the opinion of the writer that some of the reported cases of isolated paralysis of the nerves of the upper extremities immediately following labor may have been due to stretching the nerve by ill-directed muscular effort during the agonies of travail, or faulty position of the member while under anesthesia.

I recall a case of pain, loss of power, and formications

occurring in the distribution of the ulnar nerve which immediately followed a severe but normal labor, in a very excitable and muscular woman. This nerve lesion was thought to be due to pulling on some upright rods in the bed above her shoulders, thus exercising considerable tension upon the branches of the brachial plexus.

PUERPERAL PARALYSES

All of those paralyses occurring during labor or in the lying-in will be classed under this general head.

As in the paralyses of gestation, the paralyses of the puerperium may be divided into central and peripheral.

CENTRAL PARALYSES (PUERPERAL)

Hemiplegia complicating or following labor is not particularly uncommon and the prognosis is usually good. I recall a patient who was confined by Dr H. J. Lee, of Cleveland, who some hours after labor developed a slight paralysis of the right side, with considerable loss of speech. She, however, made a perfect recovery in less than 18 months. The lesion was undoubtedly embolic, probably originating from the dislodgment of a small bit of fibrin or a fragment of a clot of blood from one of the uterine sinuses. While embolism is the most usual cause of cerebral palsies in the puerperal period, yet the occurrence of hemorrhage as the result of the hydremia of pregnancy has been recorded.

Cerebral monoplegias from like causes may occur, but examination of the literature shows them to be so excessively infrequent as to suggest a coincidence rather than a complication.

It is also stated that a transient puerperal paraplegia due to exhaustion of the centers of the cord may occur. I have never met with such a case from which all the organic and hysteric elements could be confidently excluded, that was not directly ascribable to a disturbance of the circulation of the lower extremities.

Mills[8] reports a case of paralysis of both legs which

followed soon after labor and which was due to a transverse myelitis. In the septic conditions which complicate the puerperium the occurrence of a septic myelitis is not only possible, but has been observed. Handford[9] has reported a case which is evidently a diffuse myelitis resulting from puerperal sepsis.

PERIPHERAL PARALYSES (PUERPERAL)

The peripheral paralyses which occur during labor and the lying-in period are neural in origin and for convenience of discussion may be divided into two classes which will to some extent indicate their causes—*traumatic* and *non-traumatic.* Traumatic is used in relation to the nerve-tissue alone, and not in reference to the traumatisms of other tissues during labor, which open them to a septic inflammation and thus by a traumatism produce septic neuritis.

NON-TRAUMATIC NEURITIS (PUERPERAL)

The nontraumatic forms of puerperal neuritis are either (1) *septic* or (2) *non-septic.*

(a) Any nerve of the body may be inflamed during a septic puerperium. Instances of neuritis of the median, ulnar and facial nerves have been recorded as occurring as a result of puerperal sepsis.

(b) Cases of extensive polyneuritis have been observed to complicate or follow a septic lying-in period.

Both of these forms undoubtedly depend upon a true degeneration of the nervous tissue itself or septic inflammation of the perneurium. Quite a large percent of the cases are paraplegic in distribution. They are undoubtedly examples of the ordinary septicemic neuritis, and literature contains not a few classic examples. The following case quoted from Reynolds[10] affords an apt example:

"*Chronic Pyemia following Labor; Atrophic Paralysis of Both Legs; Gradual Recovery.* Mrs. H., was quite well until her first child was born in 1892, when she was eighteen years of age. The confinement took place in a Manchester hospital and she told me

that shortly afterwards she was very ill, and was operated on for a "liver abscess." She was then removed to the Manchester Royal Infirmary, and I am informed by one of the late resident surgical officers that she was found to be suffering from a chronic pyemia and paralysis of the legs. She was removed to the workhouse, and came under my care early in 1893 in the Manchester Workhouse Infirmary. She was then suffering from total atrophic paralysis of both lower extremities with contractures of the knees; there was absence of knee jerks, but the arms and sensation were unaffected. She was treated by massage, and was discharged much improved in eighteen months. At the present time (June, 1897) she is practically well and can do all her ordinary housework. She walks a little lamely because of the rigid contracture of all the joints of the toes into the soles of the feet, but all other muscles of the lower extremities are normal and well nourished. There was no previous history of alcoholism."

There occasionally occur examples of puerperal neuritis in women who have suffered no traumatism at labor nor have had any septic symptoms. That they should be regarded as *nontraumatic* and *nonseptic* is proven by the occurrence of similar cases previous to labor. These cases were first described by Moebius[11] and later by other observers, especially Eulenberg[12] who distinguished two forms:

(1) *A localized form,* in which only one or two nerves are affected. In the *arm type,* the median and ulnar; in the *leg type*—the crural. Other isolated nerves have been found affected, even the optic nerve. Pain, sensory or circulatory disturbances are exceptional, but atrophy of the muscles and reaction of degeneration commonly take place. While many of these cases recover, there are not a few of them which remain permanently crippled.

(2) *A generalized form,* in which there is widespread neural inflammation which may take the ascending type and closely resemble Landry's paralysis. The cranial

nerves have been observed to be affected in these cases, and death results from involvement of the respiratory nerves.

While some of these cases, as has been stated, present isolated neuritis, others wide-spread neural degeneration, yet they rarely develop the severe and rapid forms which are met with as a result of sepsis or other infections provocative of high fever and constitutional disturbances commonly noted in the so-called neuritis of infections.

Every grade of this form of neuritis may be met with, from a transient tingling, numbness and weakness in the distribution of a single nerve, to wide-spread paralysis with consequent atrophy, contractures and permanent disability.

A recurrent type of neuritis has been noted to appear after each labor. The following case reported by Rhein[13] is of this type:

The patient was a healthy woman who, after a normal first labor, began to suffer pain and numbness over the flexor surface of the left forearm. Weakness of the flexor muscles soon manifested itself. This condition remained with little change until after her second uncomplicated labor, when the symptoms and disability became more intense. Finally after a third normal labor the other arm became the seat of a like trouble and the left arm grew still worse. Examination revealed inability to raise the hand to the head; flexion of the fingers was weak, there was slight loss of sensation over the flexor surface of the forearms, atrophy of the intrinsic hand-muscles; the nerve-trunks were not tender to pressure.

TRAUMATIC NEURITIS (PUERPERAL)

The most frequent and most important varieties of puerperal neuritis are those which are traumatic in origin and either the direct result from injuries received by the nerve itself, or from pressure exerted by exudations into contiguous tissues, thereby producing a temporary interference with its normal conductivity from a disturbance of its molecular continuity rather than an actual disintegration of its elements.

To a clearer conception of this subject these traumatic varieties of neuritis are best considered under two separate heads; (1) those which are strictly contusional in origin and (2) those due to pressure from exudations, which exudations may be septic or nonseptic in origin.

The following case will serve to introduce us to a study of a form of neuritis that I believe to be of contusional origin, and directly ascribable to the wounding of a part of the sacral plexus by the forceps or parts of the child during labor. The case was referred to me by Dr Geib, of Cleveland:

Mrs L. C. W., aged 28, after a normal pregnancy came to confinement in November, 1900. After 15 hours of labor was delivered with forceps by Dr W. without the aid of anesthetics, a slight laceration resulting. *Immediately after the application of the instruments she felt a sensation of weakness and paralysis in the right leg and thigh.* Following her delivery the leg remained powerless, became cold and numb with considerable loss of sensation below the knee. She suffered but little pain except in the hips and back. The control of the urinary sphincters was lost for a time and is still weakened. The anal sphincters were not affected. She had no chills nor did any fever develop during her lying-in period. Although the leg felt cold, numb and powerless it has never been very sore nor tender to touch, and she has suffered but little pain except when she attempted to walk. She was on crutches for over three months. Dr Geib first saw the case about eight weeks after the confinement, and recognizing its peculiar features very kindly referred it to me for examination.

EXAMINATION

The patient is under-sized and the pelvic diameters are all under normal. She walks with a slight limp. The right leg is found to be cold but little discolored. The patient states that the toe-nails on the right foot do not grow as pidly as on the left. The shin-line is very plainly seen the right leg, revealing the fact that the anterior tibial

and peroneal groups are considerably atrophied. The extensor hallucis, extensor pollicis, extensor *brevis and minimi digiti* are intact. The calf-muscles are strong and not wasted. The knee-jerks on both sides are equal and active; Achilles' jerk is marked on the left, but faint on right; there was no ankle clonus on either side; front tap was present on the left, but absent on the right side. Three and one-half inches below the patella the right leg measures 10¼ inches, the left leg 10¾ inches; five inches below the patella the right leg measures 10 inches, the left leg 10½ inches; seven inches below the patella the right leg measures 8½, the left leg 8 inches. Measurement of the forearms show that the left is ½ inch smaller than the right. The patient being right-handed these measurements show the loss of nearly an inch in circumference of the right leg. The peroneus longus contracts very slightly to a powerful faradic current, but no contraction of the tibialis anticus can be secured. To the galvanic current both peroneii and tibialis anticus show the reaction of degeneration, which is particularly marked in the latter. There is slight loss of sensation on the dorsum of the foot, which continues up the outside and anterior aspect of the right leg, and corresponds to the cutaneous distribution of the external popliteal nerve.

This case is so typical of a form of paralysis which occurs in the distribution of the peroneal nerve following labor and of traumatic origin, that I will give a brief recapitulation of two similar cases which I have previously reported.[14]

CASE II. *Prolonged Severe Labor Terminated by Forceps; Right Peroneal Paralysis, Anesthesia, Paresthesia and Neuritis; Recovery from Neuritis and Sensory Disturbances, but Persistence of Paralysis and Atrophy.*

Mrs L., aged 26, suffered a long and severe labor; she was delivered by the use of forceps and chloroform. The morning after delivery she had much pain in the right leg and hip, with inability to lift that member. All of her symp-

toms increased in severity accompanied by all of the distressing symptoms of a severe neuritis. The pain was manifested entirely in the distribution of the external popliteal nerve. Some anesthesia was present on the dorsum of the foot and toes. The patient was examined 18 months later and there was found considerable loss of volume in the right anterior tibial and peroneal groups.

CASE III. *Prolonged Labor; Instrumental Delivery; Severe Left Peroneal Neuritis with Paralysis and Atrophy; Limited Loss of Tactile Sensation; Slow Recovery with Weakness and Atrophy of the Anterior Tibial Persisting.*

Mrs E., a primipara, aged 30, was a small woman with a contracted pelvis. The labor was severe, being 14 hours in duration and terminated with forceps and chloroform. In the evening her accoucher was sent for on account of severe pain in the left hip and leg, also numbness and tingling on the outer and anterior aspect of the left leg. There was also loss of power. The following week the sensory paralysis remained about the same, but the motor symptoms increased until her leg was practically useless. She suffered no chills nor rise of temperature nor could a pelvic exudate be demonstrated. Twenty-two days following her labor I examined the patient and found no evidence of pelvic mischief, except the exquisite tenderness of the pelvic nerves. Quantitative and qualitative changes to the galvanic current were present in all the muscles supplied by the peroneal nerve. An examination disclosed inability to dorsal flex the foot or extend the toes. She could depress the outer border of the foot but could not draw it up. There was loss of tactile sense on the dorsum of the foot and lower part of the outer and posterior aspect of the calf. Atrophy supervened but she finally made a good recovery. This patient has had two children since this case was reported, both of them being much smaller children, but in each instance she has suffered a repitition of this attack, but much less severe than the first.

The following case of extensive paralysis from injury to the sacral plexus during an ill-conducted forceps delivery was seen with Dr R. E. Skeel, September 5, 1899:

Mrs. P., aged 30, an under-sized woman with small conjugate diameter, has been married nine years and has had two children. One boy now aged six years was born after a severe labor with aid of forceps—a very small child weighing but three pounds. She states that she suffered a *phlegmasia alba dolens* during her lying-in period. Her second pregnancy was normal and she came to confinement February 25, 1899. She was in labor 36 hours, during which her pains were strong. Her physician then applied forceps which she and her husband state were kept on for a period of three hours without result; no anesthetic was administered. The forceps were then removed and after an interval of three hours were reapplied, and after another three hours of active traction, during which but little chloroform was given, she was delivered of a dead child whose head was lacerated by the forceps and the under jaw broken. Evidence does not show that the child was large. Immediately after her delivery it was found that the sphincters of the bladder were paralyzed and she also experienced great difficulty in securing a movement of the bowels. Her greatest suffering, however, was from pain about the hips and pelvis extending down to the posterior portion of the legs. There was also a burning pain and loss of sensation on the outside and anterior aspect of each leg and dorsum of the foot. The limbs were swollen, cold and useless. Nothing would control the pain and she became a morphin *habitue*. About three months later she came under the care of Dr Skeel, to whose courtesy I am indebted for the privilege of examining the case.

I found her lying in bed with marked contractures and considerable atrophy of the hamstring muscles which was most marked on the right side; there was complete paralysis and wasting of both anterior tibial and peroneal groups on either side; the sphincter control had been regained.

There was some numbness and tingling in the legs and feet. A complete footdrop was present on each side. A pelvic examination revealed great tenderness in the region of the sacral plexus, and a separation of the symphysis pubis was sufficient to allow the finger to drop between the ununited ends. Involution had taken place; no evidence of pelvic exudate could be detected. This case was extremely interesting from a number of standpoints, but the greatest interest to me was the paralysis, atrophy and loss of sensation, most marked in the distribution of the external popliteal nerves.

That the paralysis in these cases is due to an actual contusion of some part of the sacral plexus during labor seems to me to require no further demonstration. When we take into consideration the very sudden onset of the paralysis with all the characteristics of a neuritis, the distribution and course of the disability, it is impossible to conceive of any other hypothesis that is adequate to explain its development. Indeed the not infrequent occurrence of this particular type of paralysis following labor presupposes a common origin, and one intimately related to the physiologic process of parturition. Being a sequence to difficult labor causes us to immediately suspect mechanic injury to some of the component or contributing parts of the sacral plexus within the pelvis, and a resulting descending neuritis of those nerve-fibers which ultimately emerge from the great sciatic nerve to form the external popliteal or peroneal nerve. In order to appreciate the mechanism of the injury it is necessary to refer briefly to the anatomy of the parts.

You will recall that part of the fibers from the fourth and all of the fibers of the fifth lumbar segments unite to form the lumbosacral cord which passes downward winding over the sharp angle of the *linea innominata* into the pelvis where it contributes to the formation of the sacral plexus. Since, from the apex of the sacral plexus arises the great sciatic nerve from which the peroneal or external

popliteal nerve is given off, and since the sacral plexus is formed by the junction of the first, second and third, and part of the fourth sacral nerves with the lumbosacral cord, it follows that any injury to the lumbosacral cord will result in damage to some of the branches of the great sciatic nerve.

Rarely the lumbosacral cord fails to join the plexus, but continues as a separate trunk down alongside the great sciatic nerve to become the peroneal nerve without any plexal connection. (Mills).[15] LeFebre[16] and others have shown that the fibers which mainly compose this lumbosacral nerve, preserve their identity and are given off as the external popliteal or peroneal nerve. From these facts Hunermann[17] was lead to believe that this form of leg paralysis was caused from injury to the lumbosacral cord, and believed that the contributing causes were, (a) an abnormal position of the nerve, (b) a lack of proportion between the head and the pelvis, (c) a faulty position, (d) or careless instrumentation.

Bardeen[18] after a study of 200 dissections found that, "the common formation of the external popliteal nerve is from the fourth and fifth lumbar, and first and second sacral nerves (60.5%). The common formation of the internal popliteal nerve is from the fourth and fifth lumbar, and the first three sacral nerves (64.5%)."

In view of the fact that these cases present a paralysis so sharply delimited to the distribution of the external popliteal without injury to the internal popliteal renders their explanation not as simple as it appears; and as Thompson suggests, Hunermann certainly fails to explain its occurrence as completely as science demands.

Thompson[19] quotes Bardeen who has suggested a possible explanation which the former puts into the following words: "The upper roots of the sacral plexus do not lie upon the pyriform muscles, but against the bony wall of the pelvis, and are thus exposed to injury from pressure during certain difficult labors. It is the dorsal offsets of these

roots which lie against the bone and which receive the chief injury. The external popliteal nerve is made up from these dorsal offsets and therefore the paralysis is chiefly localized in the distribution of this nerve."

I think that this is on the whole the most scientific explanation of the action of traumatic force in producing this form of neuritis.

We have yet to consider those cases which occur from a slowly developing pressure from exudation, which certainly must be looked upon as traumatic in origin. These cases possess considerable interest and may result from septic or nonseptic exudates. As an instance of a pressure paralysis from a septic exudate the following case was recorded by Hervieux[20] more than 25 years ago, and is a thoroughly scientific contribution, and considering the time of its report stamps the reporter as a man of great scientific attainments and powers of observation.

A healthy woman of 19 years experienced a natural delivery. On the sixth day she had pelvic pains, fetid lochia, and fever announced the onset of puerperal infection. The septic condition was marked two days later by a dry tongue, rapid pulse, insomnia, pains in the abdomen, and a typhoidal aspect of the face. On the thirteenth day there appeared loss of power in the legs. At this time she had great fever, pulse 128, rapid respiration, distended abdomen, abundant lochia and an erythematous rash. Later, pain developed in the left iliac fossa and meteorism, the pulse and temperature remained high, the patient exhibited a dry tongue, loss of power, and profuse perspirations. On the sixteenth day it was noted that she was unable to lift the lower limbs; there was no anesthesia nor involvement of the upper limbs. Tenderness and phlegmonous indurations could be demonstrated in the left iliac fossa; they seemed to be in relation with the adnexia at the left of the uterus. Under blistering and Neapolitan ointment she improved and as her general condition mended, power began to return in the legs; the pelvic indurations were gradually absorbed, but

the patient continued to complain of vague pains in her thighs. At the end of two months the pelvic indurations had disappeared, and she had regained the use of her limbs and was discharged from the hospital in a good way to recovery.

This is an apt illustration of the septic infection producing metritis and pelvic cellulitis marked by large exudates which evidently involved the nerve-trunks producing paralysis entirely by pressure. That we may thus confidently assert its origin is further shown by the fact that the motor nerves were principally involved, the only sensory symptoms being the neuralgic pains; and moreover the recovery occupied a space of time too short to admit of a complete regeneration of the nerve-tissue.

Paralysis following the peroneal distribution occasionally develops several days after labor, sometimes occupying a week before it is fully evolved; oftentimes presenting no evidence of sepsis, and examination reveals little or no sign of pelvic exudation Mills,[21] Dercum,[22] Sinkler[23] and others have reported such cases. The following is an abridged report of the first of a series of cases reported by me in 1899.[24]

Prolonged Labor; Right Peroneal Paralysis and Neuritis with Extension to the Other Side; Slow Recovery from Neuritis, but Persistence of Some Atrophy and Paralysis.

Mrs T., was a large robust woman; second marriage; by her first husband she had one small child whose delivery was easy and normal. Her second husband is a large man and by him this was her first pregnancy, which had been uneventful. Her labor lasted 10 hours, during which she was in almost continuous pain, but terminated naturally, the child weighing nearly 12 pounds. Three days after confinement severe pains began in the right groin and hip, extending down to the foot and toes which were found to be slightly swollen and sensitive to touch; loss of power was apparent. No intrapelvic exudation or inflammation could

be detected; the lochia was normal; the temperature raised 1.5° F.; there were no chills. During this time she was under care of Dr Walker, of Carleton, Ohio, who states that she had much pain in the groin and leg. No anesthesias were present, but a distressing burning sensation was felt on the outside of the right calf, the dorsum of the foot and toes. Five days later she had a similar but much less severe pain in the same region of the left leg and foot. There was no loss of sensation on either side; the legs were sensitive to handling; considerable loss of power in both, but most marked on the right side. In eight weeks she walked without assistance and in two and one-half months the sensory disturbance had disappeared. Three months later atrophy was present in the anterior tibial and peroneii of the right leg.

Winckel[25] states that even such slight pelvic exudations as accompany phlebitis may compress the nerves, and still more important, small extravasations into the nerve sheaths may occur. Hünermann[26] refers to a case of severe sacral neuralgia where an autopsy disclosed numerous thrombotic veins in the pelvis, one of which lay alongside of the sciatic to which it was bound by inflammatory desposits.

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Six Cases of Right Hemiplegia with Aphasia

By George A. Collamore, M. D., Toledo

These cases were all seen within one year and are noticeable from the fact that they were right hemiplegias, involving the leg, arm and speech centers, while no case occurred to my observation involving the left side. They were of varying degrees of severity and duration, none proving fatal. They all occurred in middle-aged or elderly men, all in active business life.

Case I: Personal Case. I was called July 30, 1901, to see Mr L., aged about 58, a road contractor, who had been seized with paralysis when some miles from home. He was in doubt lest it might be heat prostration, but I found marked paralysis of the right leg and arm and a partial paralysis of the power of speech—motor aphasia.

The leg and arm paralysis rapidly disappeared and the aphasia gradually improved, so that in a month's time he was practically well, except for the debility usually following such attacks. He never had much difficulty in writing, and his mental powers were apparently never impaired.

He is now well, except that the paralyzed leg gets tired more easily than before.

Case II: August 26, 1901, I saw Mr R. in Oak Harbor, in consultation with Dr Huyck. He was 53 years old, weighed 210 pounds, a tile manufacturer by profession and a hard-working man. He was seized August 21 with paralysis of the right arm and leg, and with aphasia. At this time, five days after the attack, he had very little use of the leg or arm, and speech was difficult, evidently from involvement of the speech centers—motor aphasia. His mental condition was normal. He was perfectly conscious of his condition and understood everything said.

He recovered rather rapidly and is now, I understand, in good health. My notes at the time mention that he talks slowly but accurately. The tongue deviates to the ight.

Case III: In consultation with Dr Brigham, on October 31, 1901, I saw Mr. S. aged about 58, who had been seized about two weeks previously with right hemiplegia with aphasia. He had improved somewhat, but the arm and leg paralysis was almost complete. The aphasia was quite marked, much to the distress of the patient, who was quite aware of his disability, but unable to overcome it.

This case has improved to the extent that he is now able to walk and attend to business very moderately, the usual debility still continuing. The right arm is still useless, no aphasia remaining.

Case IV: Personal Case. Mr L. aged 77, a hard-working business-man, who smokes much, was seized on November 28, 1901, with ill-defined head symptoms, mainly vertigo and bad feeling in the head. I saw him soon; he was sitting in a chair, from which he suddenly slipped to the floor, apparently from inability to sit up. He walked upstairs with assistance and was put to bed, and found to have almost complete paralysis of the right leg and arm, and aphasia, without much mental disturbance. The paralysis continued for several weeks, then gradually disappeared, and is now all gone. The aphasia was of motor form, and for a time there was considerable mental incapacity, displayed mainly in loss of memory.

Case V: Personal Case. Mr G. aged about 60, of previous good health, of sedentary occupation, and of good habits, was seized some time in the night of December 19-20, with complete paralysis of the right arm, and partial paralysis of the right leg, with motor aphasia. His mind was perfectly clear, and he was particularly distressed at this sudden and unexpected attack. Within 48 hours all symptoms of paralysis and aphasia had disappeared leaving only the usual debility and perhaps a certain slowness of mental action, which is now practically gone. This case is remarkable in that so severe a lesion should disappear so rapidly.

Case VI: Personal Case. Mr W. about 51 years of age, a county official, was found lying on the floor at the court house, December 22, 1900. He was unconscious. He was taken to his home, where, with assistance, he was able to walk upstairs and go to bed. I saw him soon after, and found he had paralysis of the right arm and leg and a com-

plete inability to speak. In fact, he did not regain his power of speech until the third or fourth day after the attack. On January 4, 1901, I made the following note: Paralysis has disappeared, he can walk and use his arms as well as usual, except for some loss of strength. He can apparently understand everything said to him, but is unable to speak distinctly, though he talks fairly well.

His peculiar form of aphasia is that he is unable to speak the name of any article shown, as key, or knife. He appears to know what they are, but cannot name them, the form of aphasia called anomia. He can write his name on being asked, but cannot write from dictation. He can write the word key, on being told, but not knife. Being asked to write knife, he wrote "seer." Seeing the word knife written, he recognized it as the name of the article, and copied it correctly. Now, being shown a pencil and asked to write it, he wrote "knife." To copy the written word "pencil," he wrote "pencel," twice the same way. Asked to touch his nose with his finger, he did not succeed. When told to shut his eyes, he did so after being told several times. Puts out tongue after being told several times. Cannot add or multiply, although he was an expert in mathematics, as in computing interest, etc. He was given the following example in multiplication with this result:

Multiply	162
By	14
	838
	162
	2,558

He gradually recovered from his physical paralysis, and when I saw him several months ago, he was apparently well in body, but mentally had not made corresponding improvement, though he had no muscular aphasia, and had relearned the names of ordinary objects. His future is problematic, though it is doubtful if he ever recovers his former usefulness.

I have very recently had an opportunity to examine this patient more critically, and according to Butler's series of question, have elicited the following result:

Arm and leg paralysis absent; but the right leg gets tired more easily than before; bodily functions normal; weight apparently less than normal; is not doing business and acknowledges inability to do so.

The form of aphasia in this case is mixed. As he can hear spoken words and understand them, though slowly, I infer a slight degree of auditory aphasia is present.

No visual aphasia (alexia). As he cannot repeat spoken words correctly, or read aloud correctly, he has motor aphasia (aphemia). As he cannot write to dictation, he has partial agraphia.

As he commits errors in the use of words in speaking and writing, he has paraphasia and paragraphia.

He has a certain amount of mind-blindness, inasmuch as he does not recognize all ordinary objects and their uses; he is entirely unable to speak the names of certain things, as match-box, knife, pencil, but now writes them correctly.

He tried to give a description of washing out his stomach by Dr Greenfield, which was largely illustrated by gesture, writes "hose" and makes circle describing it—could not remember doctor's name—used to live over here (towards Monroe street), now on Adams street, he finally writes Dr Green, but is not sure of name.

In expressing ideas he often failed to give the important word, as, he said he could (dance) as well as ever, the word "dance" being written. Also, he likes to play (cards), the word "cards" being written. Also, to go to the (minstrel), the word "minstrel" being written, and he could not then pronounce it.

In analyzing this case, we find that he has not word-deafness or auditory aphasia. He has not alexia, word-blindness or visual aphasia. The only doubt is as to that of reading silently.

He has motor aphasia or aphemia. He has partial

agraphia, in not being able to write to dictation, and some paragraphia. He apparently knows the article and its use, but cannot name it, though he can write the name; partial word-deafness. There is absence of mind-deafness. In concluding the analysis, this case should come, to the best of my judgment, under division 4. (Butler's Diagnostics of Internal Medicine, p. 255.) Conduction aphasia. "If the patient uses the wrong words or talks jargon (paraphasia), and makes similar mistakes in writing, but can speak voluntarily, understand spoken words, read, and write, it is indicative of an interruption of the association tracts between the various centers, and the lesion is ordinarily in the island of Reil or the convolutions about the fissure of Sylvius." It generally coexists with auditory or visual aphasia. In this series of cases it is notable that the subjects were all men, and that the left brain only was affected.

[August 1, 1902, I am informed that this patient has had several severe epileptic convulsions since his attack, and is now making no progress toward recovery.]

The diseases suggested by the latest authorities are hemorrhage, thrombosis, embolism, abscess, tumor, gumma, or a depressed fracture of the skull.

In the cases above, all these causes may be excluded, except hemorrhage, or, perhaps in the fifth case, embolism. It is hard to conceive of a hemorrhage which would practically disappear in two days. As the arm, leg and speech focal centers lie near together, it is natural and usual for all to be affected by the same cause. If that cause is hemorrhage, what is the condition of the left cerebral vessels, which renders them more vulnerable than those of the right brain? Or was it merely a coincidence, and may the next six cases be all left-sided without aphasia?

DISCUSSION

Dr E. G. Carpenter, Columbus: Inasmuch as the writer of the paper spoke of the strangeness of these cases all being right-sided paralysis, I would just like to mention the fact that this is accounted for from an anatomic standpoint, that

the left common carotid artery arises from the aortic arch directly at its highest point, so that the caliber of the vessel is a direct continuation of the arch of the aorta, while on the right side the right common carotid artery is not a direct continuation of the arch of the aorta, but a branch of the innominate which arises from the arch of the aorta at a right angle with it, so that it is much easier for vegetative growths from the valves of the heart, or infection of bacilli, or any foreign substance to pass directly from the heart through the left common carotid into the left internal carotid and into the brain, that is the left side of the brain, and produce a cerebral hemorrhage, etc., while it is more difficult for foreign bodies to pass through the innominate, etc., to the right side of the brain, on account of the mechanic obstruction.

Dr Charles J. Aldrich, Cleveland: I feel very grateful to the essayist for this analysis of cases which he has presented to the Society. There is one point, however, to which I wish to call attention, and that is, we may occasionally have left hemiplegia and aphasia in people who are supposed to be right-handed. While they are extremely rare, yet it is a point to bear in mind, that a man can be born practically ambidextrous and by imitation alone pass as a dexter, although his speech center is on the dextral side.

The last case reported by the essayist, and the one which was so completely discussed from the standpoint of aphasia calls to my mind a traumatic case of aphasia which I had the pleasure of seeing with Dr G. W. Crile. The man received a bullet-wound which penetrated the left side of the skull just anterior and superior to the aural grove. He immediately developed a pure type of concept aphasia, a complete loss of power to recall nouns, common and proper. Immediately after his injury he was able to talk intelligently with everybody, and when brought into the hospital, in answer to the questions as to who shot him, he would answer, "Why Mr — ah — Mr — ah—, oh I can't tell his name!" He could not by any kind of effort recall the name, although his assailant was a near and lifelong friend. He told all about his accident, could use verbs, adjectives and all the parts of speech except nouns, but when it came to speaking names he was completely at sea. I would hold up a pencil, and he said, "Why, that is a—is a—a cannon." He could not tell the name of his mother. The diagnosis was that the ball was lying in the cortex of the middle of the third

temporal convolution impinging upon the concept or naming center. Upon trephining the bullet was found imbedded in the cortex of the middle of the third temporal convolution and removed. He made a complete recovery. I had the pleasure of examining him after he had left the hospital and he could tell the names of everything just as well as ever.

CHAPTER VIII—RHINOLOGY

Acute Suppurative Ethmoiditis

By JOHN A. THOMPSON, M. D., Cincinnati

As research and clinical observation increase our knowledge of pathology, regions of the body previously ignored gain new interest and importance to the student and practician of medicine. More exact observation and analysis of cases enable us to trace one group of symptoms to many causes, and later, to distinguish the underlying cause in any case. A few years ago appendicitis, salpingitis, suppuration of the gall-bladder, perforating ulcers of the stomach and intestines, and tubercular peritonitis were all grouped under one title in our medical text-books and called "idiopathic peritonitis." More exact knowledge of intraabdominal conditions makes it doubtful if there is such a disease as idiopathic peritonitis. What was formerly believed to be a distinct disease is now known to be a symptom, secondary to various primary morbid processes.

A similar change in our views is evident in regard to the causation of intracranial inflammations. We are coming to regard them as secondary infections. Physicians are trained exclusively to deductive reasoning. If this were not so, when it was proven that meningitis and brain abscess were often secondary to suppuration in the mastoid antrum the induction would have been drawn that similar brain lesions might come from suppurations in the accessory sinuses of the nose. Instead of this justifiable process of reasoning, we have waited for postmortem observations, and in the ordinary postmortem examination no attention is paid to the accessory sinuses. From these considerations we understand why cavities, whose inflammations are frequent and severe and some-

times attended by fatal results, are usually ignored in the diagnosis of disease. Perhaps the workers in the special field of rhinology are to blame for this oversight in not publishing their observations in a manner to appeal to the profession generally. Most of the papers relating to the accessory sinuses of the nose are technical and of interest only to the specialist. The present paper is an attempt to present the subject of the acute suppurations in the ethmoid in a manner that will interest and profit all practicians of medicine. It will not be technical, but largely a report of typical cases.

The predisposing cause of acute suppuration in the ethmoid cells is usually a slight chronic rhinitis extending to the lining mucosa of the cells. An attack of acute rhinitis or of influenza is the exciting cause. Numerous pyogenic bacteria grow in the secreted fluids and in the superficial layers of the inflamed membrane, adding greatly by their presence to the intensity of the process. The swelling of the membrane at the cell openings blocks them so the mucopus cannot escape into the nose. The retention of the secretion in a most sensitive region causes the intense pain which is the most characteristic symptom of the disease. The pain is deep-seated, throbbing, felt most acutely at the root of the nose but extends to the orbit and at times to all the affected side of the head. It persists for several days, if not relieved by treatment, before there is a spontaneous discharge of the retained secretions through the nose. Coincident with the pain is fever often reaching 103° F. The fever, like the pain, is lessened with the evacuation of the ethmoid cells unless general sepsis has occurred, when it will persist for days after the local condition has improved. Profuse sweats and occasionally severe diarrheas are symptomatic of the general septicemia. Respiration through the nostrils is impeded; the sense of smell is lost; the patient is dull and stupid and it requires great effort for him to think clearly. Acuteness of vision is lessened, particularly on the affected side. Occasionally the orbital tissues are inflamed, the conjunctiva reddened and the eye sensitive to light.

A case illustrating the occasional severity of the eye symptoms is that of Arthur M., attorney, aged 30 years, who consulted me March 20, 1901, with the following history: He had contracted a slight cold a week previously. For three days he had suffered from headache, rapidly increasing in intensity. The pain was over the right orbit and over the root of the nose on the same side. The day he came to the office the eye had become so congested and painful that he was unable to read. Having had previous nasal treatment he believed the headache and eye symptoms were due to a nasal condition, and consulted me instead of his regular physician.

Examination showed intense congestion of the conjunctiva of the right eye. The cornea and iris were normal in appearance, and the pupil responded promptly to light. Examination of the nose showed four large polypi growing from the anterior inferior border of the middle turbinated bone and blocking the normal openings of the ethmoid cells. The immediate removal of two of these polypi was followed by a gush of mucus and pus from the ethmoid cells with prompt relief of the pain. On account of the bleeding no attempt was made to complete the operation that day, as free drainage had been secured. Two days later the remaining polypi were removed. On the fifth day after beginning treatment the patient reported feeling perfectly well and with only a slight congestion of the conjunctiva. In addition to the operative measures, a mild astringent wash was given for the eye, and a spray containing menthol and camphor was used twice a day for the nose. The case is a typical one of acute ethmoiditis superimposed on a chronic disease, with prompt relief through drainage of the ethmoid cells.

A case illustrating the septic condition sometimes produced by acute suppurative ethmoiditis is that of Louis H., aged 35 years, policeman, who is an unusually well-developed man. He is six feet one inch in height and weighs, when in good condition, about 190 pounds.

While patrolling his beat, October 17, he had a moder-

ately severe chill. He did not take to his bed, but returned to his beat the following night when he suffered from a chill of such severity that he was obliged to go to bed and call a physician. He had a temperature at this time of 102°, but no variation from the normal pulse-rate. The chill was followed by intense headache, limited to the right supraorbital and temporal regions.

He was not satisfied with the attention given him and discharged the first physician at the end of the fourth day and called Dr J. A. Johnson. At this time he was having profuse sweats so that the axillary temperature was normal while the thermometer in the mouth showed a temperature of 102° to 103°, with a normal pulse-rate. There was still intense headache with dilation of the temporal vessels upon the right side. The nose was occluded, with little or no discharge from the nasal passages. The patient had slept very little, if any, for several days. The trouble was diagnosed by Dr Johnson as acute ethmoiditis, and in the afternoon of October 25 I saw the patient with him. At that time he had a temperature of 102° and pulse of 72, was very nervous and suffering intensely. Cocain and adrenalin were applied to the affected nostril, and a spray of adrenalin was given to contract the tissues and permit, if possible, the escape of pus from the ethmoid cells. Later the same day the temperature rose to 103°. The patient was given bimeconate of morphia and chloral so as to relieve the pain and induce sleep. The next morning cocain was applied and a probe-pointed knife was passed into the normal opening of the ethmoid cells, and this opening was considerably enlarged. Following this opening there was a discharge of pus from the ethmoid for about 10 days. The pain over the right temple lessened so that in a few days the patient was comfortable and could sleep without opiates. The adrenalin spray was stopped, and one of menthol and camphor was given. The fever continued for several days at about the same range as in the first week, and then began gradually to decline. The sweats were so abundant that the patient's

underclothing required changing several times a day. To this septic manifestation was added a profuse diarrhea that greatly weakened the patient. This symptom was controled by subgallate of bismuth and codein given every three hours. There was a gradual decline in all the symptoms so that by November 9 the patient was free from fever but still very weak. From this on convalescence was rapid. When seen at the office on November 13 the nasal fossæ were apparently normal.

When the patient was so far convalescent that he began to read, he noticed that the sight of the right eye was seriously impaired with a slight tendency to double vision. With the improvement of the general health this defect in vision rapidly disappeared.

In some cases the suppurating ethmoid may infect the maxillary antrum and produce the symptoms of the combined diseases. Physical examination only will show which is the primary disease. A case of this kind was that of Dr J. G. F., aged 25 years. On April 15, 1901, the patient had a slight chill. The teeth in the left upper jaw felt crowded as though too close together; the left side of the face began to ache and burn, and the temperature rose to 101°. He was very nervous and passed a sleepless night. Marked nausea and headache had been added to these symptoms when I saw him the next morning. Cocain and suprarenal extract were used to contract the swollen turbinated bodies, and the normal openings were probed. A yellow offensive pus was discharged from the ethmoid with relief of all the symptoms except the toothache. As the patient is very nervous codein was given to relieve the pain. The relief from the severe symptoms was maintained for four days by means of local treatment. As the result of exposure there was a sudden increase of the inflammation with great aggravation of all the symptoms. The nose became dry and swollen, the headache intense, and the temperature rose to 104°. The left side of the face was swollen with a dark blue ring of venous congestion about the eye. Vision was much reduced so the

patient could not see ordinary print with the left eye. A profuse and very offensive diarrhea aggravated the weakness produced by the fever, pain and loss of rest. Contraction of the nasal tissues and emptying the inflamed cavities gave more relief than morphia. The severe symptoms continued five days, after which there was a gradual improvement. The recovery has never been complete as any exposure to cold increases the discharge of offensive pus, which is always present although slowly lessening in amount.

Acute suppurative ethmoiditis, if promptly recognized and treated, may usually be brought to the convalescent stage in from four to seven days. When not diagnosed and no local treatment is given, it may cause general sepsis and last as many weeks. There is always the possibility of a fatal result from the sepsis or brain complications. Chronic suppuration with necrosis of the bone and never-ending headaches may follow neglected acute cases. If the disease is recognized as something more than a common cold or neuralgia and free drainage secured by local treatment, recovery is usually prompt and complete.

DISCUSSION

Dr J. H. McCassy, Dayton: The essayist has mentioned one symptom which I have observed in recognizing these cases, and that is if you look on the anterior part of the middle turbinal you will see certain secretions, and every few days that a cast of the secretions will be thrown off, blown out of the nose. You will find, if you ask patients about these casts, that they will tell you that they have noticed them, and that will be a clue as to the secretion coming from the ethmoid cells. Of course in this affection they are apt to have supraorbital neuralgia. A large number of these cases have atrophic rhinitis owing to the more or less constant secretion from the ethmoid cells. There has been quite a little change lately in the conclusion regarding these cases. A large number which were formerly called atrophic rhinitis are now called ethmoiditis. We all know that many of these conditions are commonly known under the name of colds, or grip. Many do not recognize the difference between the two, except that grip is supposed to be a little

bit worse than a common cold. In the epidemics of grip, which have periodically swept over the country, in many cases the ethmoidal cells have been affected. The epidemic of 1889, which was particularly violent, resulted in a large number of cases of ethmoiditis. In a common cold the mucous membrane of the nose, throat and bronchial tubes is affected and not the sinuses as in the grip.

Dr Thompson has spoken of nasal polypi in connection with the ethmoidal cells, saying that where you removed them there was a tendency to return. In a large number of cases of nasal polypi their origin is located in the ethmoidal cells, and nothing but a curettement or complete cleaning out will stop their growth. They will certainly return if this is not done.

We do not always find it feasible or necessary to penetrate into the ethmoidal cells in all cases. Patients will sometimes object, and then you will have to resort to the next best thing. In some of these cases I give nasal douche, using a quart of water in which I have placed some antiseptic, one of the best is baking soda, and I have them use this with the head lowered so as to prevent the solution from entering the ear. In this way you will be able to render the patients fairly comfortable and after a persistent use of the douche they will come back to you and allow you to penetrate the cells. I rarely find it necessary to use a burr or drill. I usually use an instrument with a gouge on one end and a curette on the other. When I have penetrated the cells in these cases I have not apprised the patients as to what I was doing. I would tell them that there was some little disturbance up there which I wished to remove, and in that way would get into the anterior ethmoidal cells. In some instances it is necessary to snare off the anterior part of the middle turbinate body before we are able to get into the ethmoidal cells.

Dr John A. Thompson, Cincinnati, closing: The conditions discussed by Dr McCassey are present in the chronic and not in the acute suppurative form of ethmoiditis. The so-called cast of secretions on the anterior portion of the middle turbinate are not present in the first few days of acute suppurative ethmoiditis. They do occur in the chronic form. My only object in presenting a paper of this kind to a general society such as this is, was to call attention to a field which is usually entirely ignored or overlooked in the

diagnosis of acute fevers. If there is an acute suppurative process going on in the ethmoid cells it is recognized by the fever and localized pain. By prompt treatment you can prevent destructive changes and the chronic suppurative condition which follows after the acute stage is passed. As very little has been given to the profession along this line, and those of us who are doing special work in the nasal cavities see these cases only after a destruction of the bones has set in or a chronic inflammation produced, I thought it would be well to bring this important subject to the attention of the profession in general, in order that future trouble which may last for years may be prevented. If the disease is recognized within the first 48 hours after the onset, abortive treatment may be instituted which will be successful.

CHAPTER IX

Natural Selection as Applied to Medicine and Medical Specialism

By CHARLES H. HIGGINS, A. M., M. D., Sonora

To some it may seem a little trite to announce a paper on the subject of evolution; yet to medical men and men whose minds have a scientific turn it must be noted that the mental renaissance inaugurated by such minds as Lamarck, Kant and Darwin is only beginning to bear fruit. Great as was the revolution in thought inaugurated by the fearless minds of the Reformation, a calm and sober judgment must realize that it was only an example of evolution by elimination of the unfit. It is true that in pre-Christian Greece, Arabia and Egypt we find evidence of a progress in pure science which seems marvelous, considering the abyss into which it had fallen during the Middle Ages, and many of us will fail to find in the change from paganism to popery very much of a victory for evolution; yet in the reformation of the sixteenth century only those most deeply prejudiced can fail to see a marked gain. We go back thus far only to remark that all advancement is gained by battling with error, and though error held the reins throughout the greater part of the Middle Ages, it was doomed to fall, as error must always fall, when truth breaks through the mist of mysticism and error sees her faults.

The history of the art of healing, though crude and sustained by credulity, is contemporaneous with the history of man; but the history of scientific medicine is of much more recent origin. Empiricism is contemporaneous with the earliest trustworthy historic records. Rational medicine is yet in its infancy, but the parental relationship of empiricism

to modern rational medicine can not be questioned. Though shorn of so many of the features of its ancestors as to be scarcely recognizable, it still possesses sufficient atavistic properties to leave no missing link in the chain of its evolution.

Our modern perfected methods represent the results of natural selection, or as Mr Herbert Spencer more concisely put it, "the survival of the fittest." By the retention of those methods which were found to be of use in a profession that is perpetually advancing and the discarding of the useless and unfit, we have reached a plane far higher than that of even a decade ago; so that the physician of today who draws his fund of knowledge from text-books must read them before they become shelf-worn, or he will fall behind in the modern march of medicine.

The evolution of an ideal form from a biologic point of view requires the most careful selection, even when the assistance of human agencies is invoked. Great time is required, and even when the desired object seems to be reached, a freak of nature or an atavistic accident frequently occurs which for the time may give us doubt as to the universality of our creed of natural selection. Leave the selection to nature alone, and the struggle for existence of the best may sometimes seem almost a hopeless task; but as nature has decreed that the feeble, the undesirable, must lose in the war of evolutionary succession, there is no appeal from the final judgment of annihilation, save traces here and there upon the shifting sands, which Eternity's ocean soon sweeps away. Equally slow is the evolution of an ideal form from a psychologic point of view—the ideal idea. The acme of mental activity is reached only by a succession of step-ladder advances.

The history of the Alexandrian School of Physicians gives us the first authentic account of an attempt at ideal medi- ine—an attempt to free medicine from mysticism and make rational—as well as rational views in the other fields of entific research. It was here that the propelling power of

skepticism was most adequately demonstrated; and it was here that many great discoveries were made that were forgotten in the later strifes between rationalism and fanaticism. In the Alexandrian Museum there was an anatomic room for the dissection not only of the dead, but of the living who had been condemned for crimes. Is it not probable that the circulation of the blood was demonstrated at such a period of investigation? But with the intellectual dormancy of the thousand years from the fourth to the sixteenth centuries all was forgotten, and medicine, as well as mathematics and physics, had to be born again.

We have no means of estimating the loss that the art of healing suffered during these dark ages; but could we estimate it by the progress of the past century we would be safe in assuming that it would have attained as near the ideal as human wisdom can reach. It was during these dark centuries that the attempt at rational medicine of the Alexandrian School was supplanted by the mystic knowledge of the priesthood, and natural selection, which is always progressive when not interfered with, was supplanted by artificial selection, which often enough is in error, and instead of the mind being allowed to work out its problems in a natural way, the injection of false teachings and a subordination of the thinking individual to the unthinking state, so imprisoned human reason that there could be no advancement. Superstition and medicine became united, and the baneful effects of such marriage may be seen even now, every day, by the busy physician, especially if there is a large tincturing of rural patients in his clientele. Still in the past quarter-century the survival of the fittest from a medical point of view, not only among physicians' ideas of medicine, but in the medical ideas of the lay mind, has been most pronounced, and bids fair to eliminate the unfit entirely, if medical organization keeps up the crusade of education and a determined effort not only to educate the people, but to eliminate the unfit from our profession.

With the elimination of the unfit must go the freaks of

nature and the atavistic accidents in medicine—the pseudo-physicians, and pseudospecialists, and pseudoschools of medicine. The disappearance of certain organs, as the eyes of subterranean animals, can be compared to the disappearance of certain methods of treatment and schools of medicine because of their uselessness. It is the specialist who sifts out the useful from the useless, the wheat from the chaff. As with the disappearance of the useless eyes we find an abnormal growth of the useful antennæ, so with the disappearance of useless systems we get an increased growth of the useful.

The evolution of specialism is a result of the action of an unchangeable law. As referring to some special adaptability of the individual to his environment, it is as much an example of natural selection as the establishment and maintenance of some special organic change in our anatomic and physiologic makeup. The breeder of fine sheep or cattle thoroughly understands this law, though he may never have read, or even heard of Darwin, Draper or Haeckel. He selects as the heads of his flocks those animals possessing characteristics especially suitable to his farm or his section of the country. He is only imitating nature, however, in so doing. While nature is abundantly capable of reaching this desired end, her workings are slow, and she accomplishes only in ages, without man's aid, what she may accomplish by human aid in the course of a few decades. Yet, after all, man's work is only fleeting, like an opiate for a pain. His influence upon nature is soon dissipated when his agency ceases. He acts only through human life, or more properly through the geologic age of man, while nature acts through all geologic ages, and though her actions are influenced to some extent by man, she keeps the even tenor of her way and in the end is victor over all. Few, feeble and fleeting are the monuments man will erect when compared with the handiwork with which Nature decorates her walls.

Natural selection does not effect variations which would be neither useful nor injurious. It implies the "preservation

of favorable individual differences and variations and the destruction of those which are injurious,"* such variations as may arise which are beneficial to the being under whatever conditions of life he may be placed. Hence it is unconscious, like the affinities of chemic agents. If all the individuals of any species were preserved until the natural period of their reproductiveness and life was completed, the earth would not long be able to sustain them; but as a matter of fact only a small number can survive. If all the diplomaed young men and women who are yearly let loose upon the world by the medical colleges were obliged to depend entirely upon the practice of medicine, I fear we would be obliged to raise the standard of courses leading to a medical degree much higher than at present, or many would be lost in the struggle for existence. As a matter of fact, however, a large percentage of medical graduates do not depend upon the practice of medicine for a living. They are supplied with means by the plethoric purse of father or friend, for a few years, in which they demonstrate their capacity for grappling with the great problems of medicine, or descend to the ranks of artisans or engage in mercantile pursuits.

The struggle for existence is general, in both the vegetable and animal kingdoms, and the only way in which survival may be maintained is in division of labor. We know that the horse-shoer of our boyhood days mended our broken-down wagons, sharpened our dull axes, and even fixed our striking time-pieces. It was natural selection that reduced his work to that of a horse-shoer or a tool-sharpener, or wagon-mender. The farmer of our boyhood days raised a little of almost everything which the land would produce and for which he could find a market. Today we have our farmer specialists. Here is a man who out-does his neighbor in raising potatoes; another devotes his time to wheat-raising; perhaps his farm is better adapted to this particular crop than his neighbor's. Another raises small fruits, while

*Darwin's Origin of Species.

his next neighbor is an authority upon peach culture. The tendency in all human activity is to a division of labor, apportioning to this man or that, the work which he is most capable of performing. Thus this division of labor has resulted in the creation of specialists in every art. It is as much an example of the survival of the fittest as the acuteness of the sense of smell of the fox-hound because of its usefulness, or the loss of eyes of the gopher, because of there being no use for them.

When any of the creations of nature have performed the work for which they were created, they die; genera become extinct; species fade away, because there is no work for them to do. Were it possible to abolish disease there would no longer be any work for physicians. There are certain inalienable rights, however, that were not mentioned in the Declaration of Independence, and one of these is the right of human beings to be dirty, the right to be culture media for all sorts of germs; and while as physicians we deplore this evil, we still must recognize the fact that, be there no germs, there will be nothing for the doctor to wage war against, except dislocated and lacerated uteri, rent perinea, broken bones and the various irregularities of optics; and hence with the extermination of germs, the general practician exterminates himself, and, like the mastodon of prehistoric time, is lost in the division of labor. The mobile vulgus, with its army of parasites, is a constant quantity with us, however, and the general practician need not fear for his safety, though his position be only a stepping-stone to specialism, as long as the great number of recruits of the human army come from the lower strata. There will always be need of the guiding hand and the liver pills of the general practician. With his manifold duties before him, a guide to health, whose precepts must lead to the religion of morality, of science and of art, who so uncharitable as to proclaim *delendus est!*

It is true that he cannot teach the eye to see only the beautiful, the ear to hear only the melodious, the tongue to taste only the delicious, the nose to smell only sweet per-

fume, and the hand to touch only the clean. Our religion of nature has not yet reached that degree of perfection in its development whereby our different senses will not occasionally be jarred. It must be the part of general medicine to educate the different senses as a body, to unfold to them the harmonious relationship which they should sustain to each other, and to aim as nearly as possible to a symmetric development of all, leaving special development along special lines to those specially qualified in those lines. Each individual sense is an ego to a limited extent only. I cannot taste the apple without smelling its odor. The intimate relationship existing between the different organs requires that proficiency in the treatment of anyone necessitates a thorough knowledge, not only of their anatomic relationship, but of their physiologic relationship. Then to assert that to be a successful specialist one should first be well qualified in general medicine, seems to be so self-evident a fact as not to call for comment; still it is not an unusual thing to witness men attempting to reach fame and wealth in specialism whose only experience in general practice was the clinical instruction in the medical school, or possibly a year's interneship in a general hospital.

All specialism rests upon four foundational principles—gross anatomy, histology, physiology, and pathology, and the physiology and pathology of one organ so intimately depend upon those of another that to know one well we must know them all. Hence we must deplore the tendency to hurry into a specialty, and we must also deplore the modern method of placing at the disposal of the student a number of elective studies. Fortunately this does not obtain to any extent in medical schools; but it is a fashionable fad in colleges of arts and science. Yet while we look with reverential feeling to the general practician and consider him the balance-wheel of the profession, we feel the need of an impulsive force that will cause men to delve into the minutiæ of special subjects deeper than is possible to the general practician, whose diagnosis and treatment, at least under

present conditions, must to a great extent be clinical. The great danger to specialism is inexperience with the commonplace. Experience is best gained at the bedside, where in due course of time the special adaptability of the physician to any particular line will become manifest. If he has genius it will assert itself at the bedside, and the specialty will select the man. If his development has been symmetric, with no pertuberances to mar the symmetry of a well-rounded mind, he will soon gain knowledge of that line to which he has a special adaptability, and, having found it, he will almost unconsciously drift into it, leaving the symmetric and commonplace to the general practician. A symmetric mental development is not a rare condition, as we are sometimes led to think by teachers. It represents an equality of development in all directions, though that development may be of a very low grade. With the amount of knowledge to be gained, and the impossibility of one mind becoming master of all, we must recognize it as a fact that he who attempts to carry the whole load will be weighted down to the ground. The human mind, therefore, to be more than commonplace must be a symmetric, like the cast-off masses of revolving worlds, which, overreaching the force of gravity of the parent mass, fly off in the direction of the tangent until they describe a curve peculiarly their own and work out their destiny obedient to nature's law.

To be progressive, man may not keep his mind within the limited circle of the known, nor limit its workings to equal diameters in all directions. You may not agree with me that the symmetric mind is commonplace. We are taught that the object of pedagogics is the symmetric development of the pupil's mind. Psychology affirms that the chief end of the study of mental science is symmetric mental development. The teaching is no doubt correct; yet the highest attainment in all lines of mental development cannot be reached by any one mind. The mind may be developed symmetrically to a certain point, but unless it here finds some agreeable line for further effort, it will not take the tangent directly to the goal,

but will remain within the circle, and will even allow the centripetal force of inactivity to overcome the centrifugal force of effort, and will recede to the center of the circle and become part of the ambitionless mass of the commonplace.

Such without the ever-acting law of evolution, must be the fate of the general practician of medicine. Without a tangent directed toward some goal, his usefulness is confined within an ever-contracting circle. The genius of specialism is not consistent with symmetric development. The asymmetric development of some of the lower animals has for its purpose a better adaptability to environment, and represents a survival of the fittest. Specialism will not forever travel in the circular path of the known; but has within itself the propelling force which places it beyond this circle into the hyperbolic curve of discovery. The reason of the world from St. Paul to Luther traveled within a circle. Scientists hardly dared to think outside the circle whose diameter reached only from Rome to London, until Columbus flew off on a tangent to America, and Magellan circumnavigated the globe. Medicine was equally within the charmed circle, and the tangential line of modern specialism the remotest dream of visionary speculation.

While we must admit with Nordeau that genius bears some of the ear-marks of degeneracy, we must emphatically deny that our great medical geniuses possessed any such stigmata. O'Dwyer, Murphy, and others, the inventors of apparatus that revolutionized the practice of surgery in certain lines; Lister, the antiseptic genius, and the other fathers of medical practice in its modern aspect, were geniuses and bore no marks of degeneracy like some of the masters in music, art and literature. Still the medical degenerate is a patent and necessary factor in the workshop of nature, and acts his necessary part in the working of the great law of natural selection.

The progressive man is not satisfied with an uncongenial environment or an environment which contains no elements to fructify the budding desire for better

knowledge of the truth. Medical genius frequently leads to medical hobbyism, and a hobby-horse is like another horse—it must be curbed and guided to make it useful, but having been once trained it serves a very useful purpose. The moving spirits of the past were no doubt hobbyists; their enthusiasm often brought condemnation upon them; yet the works of Nestor, of Averroez, of Keppler, Kant, LaPlace, Darwin and the living Haeckel are monuments to these master minds more enduring than shafts of marble. Genius manifests itself in a special adaptability in some particular line, in medicine as well as in music and art; but as music is an instrument with a thousand strings, and each string has its specialist,—likewise is it with art, with literature and with medicine. The law of natural selection is as infallible in medicine as in the other departments of human occupation, but the general practician is as necessary to the maintenance of medical science as the general farmer is to the maintenance of the science of agriculture.

The demand for exact knowledge that has arisen within the past century has acted as an incentive for men to enter the specialties, for it is there only that the truth is likely to be found. Democratus asserted that the final result of human inquiry is the discovery that man is incapable of absolute knowledge; that even if the truth be in his possession he cannot be certain of it. But since the days of Democratus we believe we are getting pretty nearly the truth in some lines of medical inquiry. Modern medicine attempts to find natural causes for all diseases, and long since threw off the yoke of medieval supernaturalism. It looks not to the stars nor to the wrath of God, but finds in Mother Earth and her products enough of cause. The specialists of today are not fully satisfied that they have arrived at the truth. They have produced disease to demonstrate the action of bacteria, and they have killed the germs to demonstrate the usefulness of their antiseptics. The truth is beyond our reach, possibly beyond our conception, but the search for it has stimulated investigation in special lines to such an extent as to render what

little knowledge we have more nearly exact. It has taught us that there is a cause to be found somewhere in nature for all our physical ills. It has invented the microscope to study pathology and physiology; and by the discovery of causes, it has watched the action of therapeutic agents. It has added new and potent remedies to combat disease and has eliminated the useless and unfit.

This dissatisfaction with one's environment, which is characteristic of all nature, is equally patent in the medical profession, and leads to two note-worthy results: A weeding-out of the incompetent, and a better equipment of those capable of withstanding the struggle for existence. It weeds out the incompetent, because no competent man will be content to stand still; and the practician of medicine who stands still, whose books are the shelf-worn tomes of his preceptor, is a contradiction of the law of evolution, which we have assumed to be so comprehensive that no progressive physician will raise a question as to its infallibility. It leads to a better equipment of the competent, for he is the first to note his own imperfections, and is the first to profit by his errors.

An English rhymester once wrote that a little learning is a dangerous thing, and advised that one drink deep of the fountain of knowledge, or taste it not. The appetite for knowledge, like the appetite for artificial stimulants, grows greater and greater, but unlike in the case of stimulants man never becomes full. Every physician here has experienced the difficulty of prescribing for and carrying treatment to a successful termination in a man whose knowledge of physiology was gained at a temperance lecture or from reading a patent-medicine circular. Physiology of all subjects pertaining to medicine is the most in the dark. Nature throws a veil over her workings, and permits us to see only her grosser actions through its meshes. Yet the ignoramus who has possibly seen the blood current in the webb of a frog's foot through the microscope or has probably vivisected a half-year old bull-calf, answers the question of an examiner, made one by his political "pull," and receives a certificate to teach

physiology to our children from a text-book that receives the sanction of the W. C. T. U., and the effect is just what Pope deprecated.

The failure of an unqualified man to attain renown as a specialist often drives the would-be specialist to newspaper specialism. He succeeds, after a manner, in pulling the wool over the peoples' eyes (and the majority of the people are very susceptible to such wool-pulling). He gains the confidence of a clientele sufficient, though not of a desirable quality, to make him a fair income; or, failing in this, he travels over the country, and using the newspapers as a herald, rakes in the golden sheckles of his dupes until found out, when he strikes out for pastures new and patients more green. The law of the survival of the fittest works doubly in this case; for with his patients only the strongest can recover, and these are less likely to consult the next quack, and thus he too is the remainder in the division of labor.

In general medicine the elimination of the unfit is a much slower process. He will long be with us. Ten-year practice acts and lax medical examining boards and supreme courts and Christian Science legislators will long make it possible for men to become legally qualified who are not educationally qualified. But with the more liberal education of the masses, this class of practicians will yield to nature's unrelenting law, and be lost in the struggle for existence. With him must also go the legalized, but unqualified specialist. Nearly every city of a few hundred population has its catarrh specialist, its genitourinary and lost-manhood specialist, legalized though he may be; yet he is a money-sucking leech, a stigma upon the escutcheon of scientific medicine. He is likewise the friend of the pure quack and the unethical portion of our regular profession. He exists like his friend the quack, through the sympathy of tender-hearted physicians and his blackmailing influence upon the ward politician. Together with the pure quack, this class of specialists seems doomed by our natural law.

The Roman Horace wrote wisely of his art, but assumed

too much of the divine when he said *"Poeta Nascitur, non fit."* The world is beginning to realize that the grand, the sublime, the nigh-perfection is reached only by a gradual process. The one rosebush that blossoms after frost is a freak, yet the seed from that rose is more likely to stand the bitings of Jack Frost than those from the next bush, and thus by selection the gardener may finally get a rose whose bloom will grace the lapel of the well-dressed specialist throughout the coldest winter.

As the poet shows the refinement of soul of one in love with nature, and thus separates himself from the common herd of humanity; so the specialist in medicine, deeply in love with that branch of his art in which he feels his greatest competency, delves deeper into its depths and becomes more closely in touch with its intricacies than the man who attempts to cover the whole field of medicine. But can we say of the specialist *"Nascitur non fit?"* Many of the laity seem to have the notion that there is something akin to the supernatural in medical specialism. This idea is of course, the child of charlatanism and the Weltmeristic advertisement. Doctors, be they specialists or not, are not born under any special dispensation of Providence, and they are not able to keep diseases from themselves by any mysticism. They have no secrets save the closeted skeletons of their patients.

CHAPTER X—MEMBERSHIP AND DELEGATES

Permanent Members
The Ohio State Medical Society

CAPITALIZED: Life Members.

Local Secretaries will please notify the Secretary of errors or omissions, and forward obituary notices with their annual catalogues.

A

Abbott, Charles N.....Cincinnati, 1892
Ackerman, Ernest V.....Fredericktown, 1902
Albl, Michael A.....Cleveland, 1892
Alcorn, Eli G.....Gallipolis, 1895
Alcorn, John B.....Gallipolis, 1894
Alderdyce, William W.....Cleveland, 1900
Aldrich, Charles J.....Cleveland, 1892
Aldrich, Daniel B.....Ashtabula, 1892
Allard, Lorenzo D.....Portsmouth, 1894
Allen, Dudley P.....Cleveland, 1885
Allen, George M.....Cincinnati, 1892
Allen, Harry Sherwood.....Gallipolis, 1901
Allen, Samuel E.....Cincinnati, 1892
Alter, Francis W.....Toledo, 1902
Anderson, Lewis C.....Greenville, 1898
Andre, Orrin C. .....Waverly, 1888
Archer, J. R.....North Baltimore, 1892
Armentrout, Lyman W.....Mt. Vernon, 1892
Armstrong, Edward Elliott.....Sylvania, 1902
Ayers, Merrit M.....Continental, 1900
Ayers, Stephen C.....Cincinnati, 1877
Ayers, Wylie McLean.....Cincinnati, 1901

B

Backus, Leonard C. .....Fayette, 1895
Bailey, Gilbert L.....Cincinnati, 1901
Bain, Frank D.....Kenton, 1885
Baker, Albert R.....Cleveland, 1886

Baker, Charles .....Palestine, 1900
Baker, Joseph P.....Findlay, 1891
Baker, William O. .....Louisville, 1882
Baldwin, J. F.....Columbus, 1875
Ballinger, John B. .....Bradford, 1880
Bamberger, Herman .....Toledo, 1902
Barker, Fred .....Dayton, 1898
Barnes, Albert S.....Cambridge, 1901
Barnes, Benjamin F. .....Newark, 1900
Barnhill, James U.....Columbus, 1884
Barrere, D. M.....Dayton, 1884
Bates, Fred L. .....Lima, 1890
BEARDSLEY, C. E.....Ottawa, 1869
Beck, John S..... .....Dayton, 1879
Beckwith, Seth W.....Toledo, 1892
Beebe, Brooks F.....Cincinnati, 1901
Beers, Adam M.....Newcomerstown, 1882
Bell, David B.....Fostoria, 1900
Bell, Read Letts.....Springfield, 1899
Belt, John H.....Cleveland, 1897
Belt, Richard Cass .....Milford, 1892
Bennett, Walter C.....Mt. Gilead, 1891
Berry, George O.....Lancaster, 1899
Bertolette, Harry B.....Shreve, 1896
Bessy, J. Mortimer.....Toledo, 1887
Bethauser, Charles M. .....Columbus, 1895
Bettmann, Henry W.....Cincinnati, 1901
Betts, Charles .....Toledo, 1901
Binder, Albert .....Ottoville, 1899
Bird, Charles W.....Continental, 1902
Bird, Edward H.....Dupont, 1892
Black, Albert P.....Bradner, 1899
Blair, Benjamin H.....Lebanon, 1892
Blair, Harry W.....Mt. Vernon, 1900
Blake, Francis W.....Columbus, 1892
Blake, William H.....Shadeville, 1878
Blakely, George W.....Washington, C. H., 1900
Bleile, Albert Martin .....Columbus, 1882
Bodman, Lewis H.....Toledo, 1892
BOERSTLER, George W.....Lancaster, 1870
Bohl, John, Sr.....Watertown, 1892
Bohlender, Edmond E.....Dayton, 1901
Bond, John Wesley.....Toledo, 1892
Bonifield, Charles L. .....Cincinnati, 1892

Bonner, Calvin A. .....Dayton, 1892
Bonner, Horace .....Dayton, 1890
Bown, Herbert H.....Pleasant City, 1899
Boyd, James P.....Akron, 1892
Bozman, Harden E.....New Alexandria, 1900
Bradford, William N.....Cambridge, 1896
Brady, Mifflin B.....Cincinnati, 1892
Brand, Walter W.....Toledo, 1896
Brannan, Thomas H.....Canal Dover, 1884
Brashear, B. B.....Atlantic, N. J. 1886
Brattain, George E.....Payne, 1901
Brayton, Asa .....Carey, 1892
Breck, Theadore B.....Redridge, 1900
Briggs, Charles E.....Cleveland, 1901
Brockett, Andrew J.....Cleveland, 1874
Brogg, William N. .....Reading, 1901
Brokaw, William F.....Cleveland, 1900
Brown, Emory O. S.....Avon, 1895
Brown, Ernest E.....Cleveland, 1901
Brown, John Edwin.....Columbus, 1892
Brown, Wilmont Elton.....Coolville, 1900
Bruehl, Gustave .....Cincinnati, 1892
Brundage, N. E.....Delphos, 1902
Bruner, William E. .....Cleveland, 1897
Brunning, Frank .....Cincinnati, 1901
Brush, Edmund C.....Zanesville, 1878
Buckingham, John M.....Springfield, 1885
BUCKNER, James H.....Cincinnati, 1863
Buechner, William L.....Youngstown, 1879
BUNN, James W.....West Union, 1872
Bunts, Frank E.....Cleveland, 1892
Burnes, William Anderson.....Dayton, 1901
Burnham, Reed D. .....Piqua, 1898
Burritt, Charles A.....Toledo, 1902
Bushnell, William S.....Mansfield, 1902
Buttemiller, John C.....Cincinnati, 1897

C

Caldwell, Charles E.....Cincinnati, 1901
Caldwell, James S.....Cincinnati, 1892
Caldwell, John L.....Waverly, 1894
Calhoun, S. Frederick.....Rumford Falls, Me., 1901
Calhoun, William M. .....East Liverpool, 1892
·llinan, D. F.....Corning, 1892

Campbell, Elizabeth .....Cincinnati, 1900
Carothers, Robert .....Cincinnati, 1901
Carpenter, Julia W.....Cincinnati, 1879
Carr, Edward C.....Coshocton, 1900
Carroll, Travis .....Cincinnati, 1901
Carson, Arch I. .....Cincinnati, 1892
Carson, Frank D.....Benton, 1892
Case, Freeman D.....Ashtabula, 1886
Chadbourne, Theodore L.....Gallipolis, 1901
Chadwick, Leroy S.....Cleveland, 1892
Chamberlin, Charles S.....Kinsman, 1892
Chapman, Byron .....Copely, 1885
Chapman, George L.....Toledo, 1899
Chapman, William C.....Toledo, 1875
Cherry, Wilbur T.....McArthur, 1901
Chidester, Cyrus W.....Delaware, 1895
Chisholm, Horatio .....Marion, 1895
Chrisman, Claud N.....Dayton, 1901
Clapp, Harold T.....Cleveland, 1892
Clark, Charles F.....Columbus, 1885
Clark, Frank S.....Cleveland, 1892
Clark, John Albert.....Glencoe, 1901
CLARK, John H.....Mechanicsburg, 1869
Clark, Myron S.....Youngstown, 1879
Clark, William .....Cleveland, 1902
Clarke, Ida .....Youngstown, 1889
Clay, William P.....Convoy, 1896
Cleveland, John L.....Cincinnati, 1900
Clevenger, Richard E.....N. Washington, 1901
Coates, Benjamin O.....Cleveland, 1898
Cobb, Fred A.....Toledo, 1901
Coldham, William W.....Toledo, 1892
Cole, William W.....Columbus, 1900
Cole, William W.....Columbus, 1896
Coleman, N. R.....Columbus, 1875
Coleman, Warren .....Troy, 1899
Collamore, George A.....Toledo, 1880
Colville, George H.....Circleville, 1887
Colville, Robert Woods.....Mt. Vernon, 1899
Comstock, Oliver G.....Toledo, 1902
Cone, Stephen E.....Cincinnati, 1900
CONKLIN, W. J.....Dayton, 1868
CONNOR, Phineas S.....Cincinnati, 1868
Conrad, George R.....New Vienna, 1890

Cook, Alta F.....Sandusky, 1902
Cook, George F.....Oxford, 1880
Cook, Joseph E.....Cleveland, 1895
Cooper, Albert .....Columbus, 1881
Cooperrider, Charles A.....Columbus, 1892
Cope, Ellis C.....Barton, 1895
Corlett, William T. .....Cleveland, 1882
Corson, Orrillas Melville .....Middletown, 1879
COTTON, J. D.....Marietta, 1852
Courtright, Dudley W.....Circleville, 1898
COURTRIGHT, George S.....Lithopolis, 1867
Courtright, Theodore .....Columbus, 1899
Covington, P. D.....Bellefontaine, 1901
Cowles, George E.....Ostrander, 1900
Cox, John M.....South Salem, 1877
Crane, A. Melville.....Marion, 1881
Crawford, Andrew J.....Glouster, 1896
Crile, George W.....Cleveland, 1892
Cromer, Peyton E.....Piqua, 1900
Crosett, Andrew L.....Gibsonburg, 1902
Crossland, Jefferson C.....Zanesville, 1890
Culbertson, James C.....Cincinnati, 1874
Culbertson, Lewis Rogers.....Zanesville, 1896
Cushing, Edward F.....Cleveland, 1892
CUSHING, Henry K.....Cleveland, 1857
Custer, Harry James.....Columbus, 1900

D

Dager, William F.....Ft. Seneca, 1902
DANDRIDGE, Nathaniel P.....Cincinnati, 1871
Darbyshire, Morris .....McComb, 1900
Darrah, Joseph Wilson.....Martins Ferry, 1897
Davidson, J. Allen.....Dayton, 1896
Davidson, John F.....N. Amherst, 1893
Davidson, Nicholas P.....Hillyards, 1890
Davis, Carrie Chase.....Sandusky, 1902
Death, Hugh J.....Franklin, 1892
Deford, Justin Morris.....Wagerman, 1901
De La Barre, Paul.....Port Clinton, 1892
Denman, William C.....Marion, 1882
Deuschle, William D. .....Columbus, 1895
Devers, A. B.....Cincinnati, 1901
DeVilbiss, Allen .....Toledo, 1887
Dice, Seth Delmer.....Xenia, 1902

Dice, William Gordon.....Toledo, 1902
Dick, William L.....Columbus, 1892
Dickey, T. A.....Middletown, 1879
Dickey, William A.....Toledo, 1902
Dine, Colson L.....Minster, 1892
Dixon, Myrwood T.....Columbus, 1895
Dolina, John F.....Dayton, 1892
Dorman, Harry Wadsworth .....Ashtabula, 1886
Dorsey, Joseph F.....Dresden, 1894
Dugan, John P.....Springfield, 1899
Duncan, Arthur M.....Bucyrus, 1886
Duncan, James A.....Toledo, 1874
Dunham, John Dudley.....Columbus, 1902
Dunham, John M.....Columbus, 1895
Dunlap, Charles O.....McArthur, 1881
Dunn, Oscar B.....Ironton, 1900
Dutton, Charles F.....Cleveland, 1880

E

Eakins, Jehu .....Patriot, 1894
Eastman, William H. .....Levering, 1901
Eddy, Charles W.....Marietta, 1888
Edwards, Isaac C.....Columbus, 1900
Ehret, Gratten Almer.....Cleveland, 1900
Eichberg, Joseph .....Cincinnati, 1882
Ely, J. Sykes.....Barnesville, 1892
Emanuel, George E.....Edgerton, 1902
Emerick, Edson J.....Columbus, 1895
Engleby, Frank E.....Vermillion, 1902
Entrikin, Franklin B.....Findlay, 1902
Erwin, Norman B.....Gibsonburg, 1891
Esch, Joseph P.....Huron, 1892
Evans, Arthur E.....Columbus, 1882
Evans, George B.....Dayton, 1892
Evans, Otho .....Franklin, 1892
Everts, Orpheus .....Cincinnati, 1885
Ewing, William A.....Dayton, 1902
Eyleer, Oliver R.....Cynthiana, 1901

F

Faber, Charles A.....Toledo, 1892
Farnsworth, George B.....Cleveland, 1895
Fassig, John M.....Zanesville, 1893
Fausett, R. C.....Geneva, 1896
Fauster, John U.....Archbold, 1899

Fels, George W.....Cincinnati, 1892
Fiser, J. H.....Malinta, 1902
Fisher, Charles E.....Toledo, 1901
Fisher, Henchel .....Lebanon, 1901
Fisher, Phillip .....Cincinnati, 1892
Fisher, William H. .....Toledo, 1892
Fitzpatrick, Thomas V.....Cincinnati, 1890
Fitzsimmons, James F.....Bucyrus, 1892
Fledderjohann, Henry E.....New Knoxville, 1902
Floyd, James C. M.....Steubenville, 1884
Foertmeyer, Charles H.....Cincinnati, 1892
Folett, Alfred Kane.....Granville, 1900
Formorin, John L.....Marathon, 1892
Foshay, P. Maxwell.....Cleveland, 1892
Foster, E. Marion.....Portsmouth, 1900
Foster, George F.....Kingston Centre, 1882
Foster, Sidney D.....Toledo, 1902
Fowler, Silas W.....Delaware, 1873
Fox, Joseph F.....New Philadelphia, 1895
Fraker, Harvey C.....Columbus, 1895
Francis, Albert W.....Ripley, 1892
Fraser, John M.....Cleveland, 1892
Fraunfelter, James .....Canton, 1886
Freiberg, Albert H.....Cincinnati, 1900
French, Edward H.....Hamilton, 1901
French, James M.....Cincinnati, 1892
Friedlander, Alfred .....Cincinnati, 1901
Frocht, William H.....Tiffin, 1902
FULLER, S. W.....Bellefontaine, 1853

G

Gahm, John L.....Jackson, 1895
Gaither, Alfred .....Cincinnati, 1899
Gale, George T.....Newport, 1888
Garand, Narcissus .....Toledo, 1902
Gardiner, W. G.....Toledo, 1892
Garlick, H. Stow.....Cincinnati, 1901
Geissinger, Henry Wilson.....Grove City, 1900
George, John F.....Ft. Jennings, 1900
Geyer, Joseph L.....Norwich, 1892
Gibbon, Harmon B.....Tiffin, 1891
Gillette, William J.....Toledo, 1892
Gilliman, D. Tod.....Columbus, 1873
Gillman, Earl M.....Columbus, 1890

Glenn, William W.....Hillsboro, 1895
Goebel, Anna M.....Lima, 1892
Goetz, Ferdinand E.....Cleveland, 1892
Good, Harman .....Sulphur Grove, 1900
Goode, Burwell P.....Cincinnati, 1892
Goodhue, George .....Dayton, 1884
Gordon, John L.....Columbus, 1900
Gordon, Patrick H.....Junction City, 1894
Gores, Ferdinand C.....Cincinnati, 1892
Goss, Clarence W.....Lancaster, 1895
Goss, John H.....Lancaster, 1884
Gotwald, David King.....Springfield, 1899
Graefe, Charles .....Sandusky, 1891
Graefe, William .....Sandusky, 1874
Granger, Francis M.....Russell, 1881
Gray, Francis C.....Dayton, 1894
Green, Henry S.....Cardington, 1878
Green, Lindley M.....Wilmington, 1900
Green, Myron D.....Cincinnati, 1901
Greenamyer, P. S.....Orrville, 1900
Greene, Duff Warren .....Dayton, 1882
Grier, Otto P.....Cincinnati, 1901
Grimm, Adolph .....Cincinnati, 1892
Groves, John E.....Uhrichsville, 1884
Grube, Willis W.....Toledo, 1901
Guerin, Zophar F.....Columbus, 1884
Guntrum, William Elder.....Greenville, 1900
Gutermuth, William C. .....Versailles, 1899

H

Haag, Daniel E.....Liberty Centre, 1901
Halderman, S. S.....Portsmouth, 1896
Hall, Emerson V.....Convoy, 1898
Hall, Harry L.....Toledo, 1901
Hall, Rufus B.....Cincinnati, 1884
Hall, Willard A.....Chillicothe, 1896
Halleck, Frank D.....Bowling Green, 1902
Halston, J. G. F.....Zanesville, 1892
Hamann, Carl A.....Cleveland, 1895
Hamer, William W.....Bellefontaine, 1895
Hamilton, C. S.....Columbus, 1891
Hamilton, Lewis D.....Marion, 1896
Hamilton, Norval A.....Franklin, 1901
Hamilton, W. D.....Columbus, 1886

Haney, Josiah C.....Dalton, 1896
Hannah, Ralph B.....Georgetown, 1900
Hanson, David S.....Cleveland, 1898
Hanson, James S.....Sandusky, 1902
Hardy, Irene .....Massillon, 1897
Harper, Edward A.....Columbus, 1896
Harrison, Charles M.....Napoleon, 1902
HARRISON, Eugene B.....Napoleon, 1869
HART, Benjamin F.....Marietta, 1854
Hart, Romeyn B., Jr.....Marietta, 1892
Hart, Samuel .....Marietta, 1887
Hartman, George W.....Wauseon, 1887
Hartman, Samuel D.....Tippecanoe City, 1874
Hartnett, Daniel .....Toledo, 1902
Hasencamp, Oscar .....Toledo, 1891
Hatch, Charles A.....Newark, 1893
Hathaway, Harrison .....Toledo, 1874
Hatsher, Harry Haver.....Dayton, 1901
Havlicek, Frank J.....Cleveland, 1901
Hawes, Sylvester A.....Greenville, 1900
Hawley, Edwin P.....Cleveland, 1892
Hayes, John D.....Somerset, 1895
Haynes, John Tennyson.....Sandusky, 1893
Hayward, Edwin T.....Waterford, 1896
Heady, James T.....Glendale, 1899
Hecker, E. A.....New Madison, 1900
Heckler, Frank A.....Columbus, 1900
Heffner, George W.....Circleville, 1895
Heffron, Charles H.....Melamore, 1902
Heidingsfield, Meyer L.....Cincinnati, 1901
Heistand, Howard E.....Kenton, 1901
Helmick, George W.....Harrisburg, 1900
Hendershot, Byron C.....New Philadelphia, 1897
Hendershott, Ralph R.....Tiffin, 1902
Henderson, Carl W.....Waynesville, 1901
HENDERSON, David W.....Marysville, 1856
Henderson, George W.....West Cairo, 1892
Henderson, Graily .....Marysville, 1899
Henderson, Lutrelle .....Marysville, 1899
Henderson, Robert .....Urbana, 1892
Hendley, Frank W.....Cincinnati, 1892
HENDRIXSON, Hugh .....Columbus, 1868
Hendrixson, Ola S.....Columbus, 1900
Hendrixson, Oliver P.....Yellow Springs, 1900

Herrick, H. J. ..... Cleveland, 1880
Hersh, E. G. ..... McComb, 1892
Hessell, A. A. ..... Put-in-Bay, 1902
Heston, E. N. ..... Thurston, 1900
Heston, Joseph Z. ..... Pataskala, 1898
Heweston, Alexander H. ..... St. Clairsville, 1894
Hickey, Wiley D. ..... Leipsic, 1902
Higgins, Charles H. ..... Sonora, 1900
Hill, William W. ..... Weston, 1892
Hiner, Solomon B. ..... Lima, 1874
Hines, J. Arthur ..... Van Wert, 1879
Hobson, John A. ..... Flushing, 1891
Hobson, Joseph F. ..... Cleveland, 1897
HOFF, Joseph W. ..... Pomeroy, 1872
Holcomb, Calvin B. ..... Corning, 1898
Holliday, Benjamin Whitney ..... Cleveland, 1875
Holliday, William Wallace ..... Cleveland, 1892
Hollister, George A. ..... Toledo, 1897
Holman, Austin W. ..... Circleville, 1895
Holmes, Christian R. ..... Cincinnati, 1892
Holst, E. Bertram ..... Rosford, 1901
Holt, Oliver P. ..... Cincinnati, 1901
Homes, Will W. ..... Columbus, 1895
Hoover, Charles F. ..... Cleveland, 1896
Hoover, Collins M. ..... Alliance, 1885
Hoover, Lewis S. ..... Laura, 1901
Hoover, Thomas C. ..... Columbus, 1891
Hoppe, Herman H. ..... Cincinnati, 1892
Hottendorf, Louis P. ..... Cincinnati, 1892
Hough, Wayland S. ..... Cuyahoga Falls, 1875
Hous, George W. ..... Clayton, 1892
House, Augustus F. ..... Cleveland, 1880
House, Charles F. ..... Painesville, 1897
House, Lindley F. ..... Leesburg, 1899
Hover, W. E. ..... Lima, 1902
Howard, Adam B. ..... Cleveland, 1897
Howard, William T., Jr. ..... Cleveland, 1895
Howell, Conrad A. ..... Columbus, 1901
Howell, J. Morton ..... Reibold, 1892
Howell, William E. ..... Rio Grande, 1901
Howells, James O. ..... Bridgeport, 1897
Hubbard, Thomas ..... Toledo, 1889
Hudson, J. Franklin ..... Canton, 1892
Hughes, Dorrance E. ..... Delaware, 1895

Hughes, E. E.....Oak Hill, 1895
Hughes, Frank M.....Sandusky, 1892
Hulick, John W.....Springfield, 1898
Hulin, Oscar W.....Greenford, 1895
Humiston, W. H.....Cleveland, 1880
Humphreys, Charles H.....Dayton, 1892
Hunt, Abram H.....Wooster, 1892
HURD, Anson .....Findlay, 1870
Husted, E. G. .....Beamsville, 1900
Huyck, Emery B.....Oak Harbor, 1902

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Iglauer, Samuel .....Cincinnati, 1901
Ikirt, George P.....East Liverpool, 1882
Ingersoll, Ebenezer J.....Columbus, 1900
Ingersoll, John M.....Cleveland, 1897
Ireland, Samuel A.....Washington, C. H., 1892
Ireland, W. E.....Washington, C. H., 1887

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Jacobs, Harold H.....Akron, 1892
Jacobson, Julius H.....Toledo, 1901
James, William S.....Cleveland, 1897
Jamison, J. Ross.....Apple Creek, 1898
Jenks, William O.....Nottingham, 1892
Jennings, Gainor .....West Milton, 1892
Jerome, Mark .....Toledo, 1901
JEWETT, Henry J.....Dayton, 1871
Johnson, Alice M.....Columbus, 1895
Johnson, Fred L.....Worthington, 1897
Johnston, Henry F.....Haskins, 1902
Johnston, J. Ambrose.....Cincinnati, 1901
Johnstone, Arthur W.....Cincinnati, 1899
Jones, Harry S.....Columbus, 1895
JONES, John D.....Cleveland, 1870
Jones, Levi M.....Jamestown, 1892
JONES, Richard E.....Gomer, 1863
JONES, Thomas W.....Columbus, 1847
Joseph, Leopold .....Cincinnati, 1892
Judkins, William .....Cincinnati, 1892
Judy, Charles S.....Miamisburg, 1896

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Kaestlen, Samuel E.....Cleveland, 1892
Kahn, Louis .....Columbus, 1895

KAY, Isaac .....Springfield, 1853
Keck, Peter A.....Cincinnati, 1892
Keller, Lester .....Ironton, 1900
Keller, Thomas F.....Toledo, 1887
Kemp, Lucia .....Bucyrus, 1892
Kerns, J. T. Walpole.....Bellaire, 1892
Keycraft, Albert J.....Fostoria, 1898
Kiely, William E.....Cincinnati, 1892
Kiester, William H.....Arcanum, 1899
Kimmell, Jacob A.....Findlay, 1892
King, Watson Lawrence.....Granville, 1899
Kinnison, Ulysses L.....Limerick, 1899
KINSMAN, David N.....Columbus, 1864
Kirkley, Cyrus A.....Toledo, 1874
Kitchen, Francis A.....Toledo, 1892
Klein, Peter J.....Portsmouth, 1895
Knapp, Charles C.....Zanesville, 1899
Knight, Arthur L.....Madisonville, 1900
Knowlton, William A.....Cleveland, 1892
Koehler, Max .....Cincinnati, 1892
Kofron, Joseph V.....Cleveland, 1898
Kramer, S. P.....Cincinnati, 1900
Krape, Joseph H.....Kent, 1901
Krause, Bernard .....Cleveland, 1880
Krause, Lewis J.....Cincinnati, 1892
Krauss, Leon S.....Middletown, 1892
Krauss, William Henry .....Newark, 1900
Kunz, John C.....Cincinnati, 1901

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Lambright, Simon .....Lees Creek, 1899
Landman, Otto .....Toledo, 1892
Langdon, Frank W.....Cincinnati, 1892
LARIMORE, Frank C.....Mt. Vernon, 1871
Large, Secord H.....Cleveland, 1901
Larkin, John C.....Hillsboro, 1901
LaSalle, James J.....Toledo, 1902
Lash, Josiah W.....Chillicothe, 1879
Lathrop, Arthur B.....Swanton, 1887
Law, Mary C.....Toledo, 1902
Lawless, James T.....Toledo, 1887
Lawrence F. F.....Columbus, 1888
Lawrence, James C.....Columbus, 1895
Leach, Sherman .....Columbus, 1888

Lee, James F. .....Mt. Vernon, 1898
Lehman, Clarence W.....Eaton, 1895
Lehmann, Frank J. J.....Toledo, 1902
Lenhart, Charles M.....Zanesville, 1894
LEONARD, Benjamin B.....West Liberty, 1854
Leonard, Edward L.....New Antioch, 1897
Lerch, Adelbert Verne.....Pleasantville, 1898
Leslie, John M.....Chillicothe, 1878
Lewis, Harry A.....Continental, 1899
Lewis, Robert C. M.....Marion, 1898
LEWIS, William C.....Rushville, 1869
Lichliter, David C.....Dayton, 1892
Lightner, Samuel B.....Sabina, 1888
Lincoln, William R.....Cleveland, 1896
Lindsay, John A.....Salineville, 1895
Linhart, Christopher P.....Columbus, 1900
Link, Joseph A.....Springfield, 1899
Loney, D. W.....Norwalk, 1902
Longfellow, R. C.....Fostoria, 1892
Longstreth, William E.....Comly, 1900
Longsworth, Milton J.....St. Marys, 1897
Lormier, H. F.....Iberia, 1898
Loughridge, William Edward.....Mansfield, 1902
Love, George Rusk.....Toledo, 1902
Love, Maro J.....Bloomingville, 1900
Love, Wesley .....Higginsport, 1901
LOVING, Starling .....Columbus, 1858
Lower, William E.....Cleveland, 1896
Lowman, John H.....Cleveland, 1877
Loyer, A. E.....New Washington, 1898
Lucas, Arista O.....New Washington, 1899
Lucas, Valentine Charles.....Cleveland, 1892
Lukens, Charles .....Toledo, 1902
Lupton, Ella G.....Gallipolis, 1901
Lyle, Benjamin F.....Cincinnati, 1892
LYMAN, Cornelius N.....Wadsworth, 1852

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McCall, Edwin E.....Lima, 1902
McCallum, Duncan D.....Crestline, 1899
McCann, Thomas H.....Scioto, 1901
McCassey, John H.....Dayton, 1901
McClain, Jesse .....Coshocton, 1899
McCLURE, James .....Marietta, 1866

McClung, John C.....Leipsic, 1887
McCOLLUM, Ephraim J.....Tiffin, 1871
McCormick, Frank .....Fremont, 1902
McCoy, Clem D.....Kenton, 1892
McCready, S. R.....Leetonia, 1898
McCullough, Adam H.....Mansfield, 1897
McCullough, Joseph A.....Steubenville, 1894
McCURDY, John .....Youngstown, 1870
McCurdy, Stewart L.....Pittsburg, Pa. 1882
McDougal, John G.....New Lexington, 1894
McGavern, Frank .....Columbus, 1901
McGee, John B.....Cleveland, 1880
McIntire, William .....Ostrander, 1880
McKEE, Edward S.....Cincinnati, 1886
McKim, Frank E.....Marietta, 1886
McKinley, Jones William.....Harrisburg, 1900
McKitrick, Llewellyn .....Dublin, 1900
McMillen, DeWitt Howard.....Orrville, 1900
McMurray, Alexander B.....Marion, 1879
McNeill, Russell C.....Bell Centre, 1901
MacGuire, Charles W.....Toledo, 1902
Mackenzie, John C.....Cincinnati, 1892
Macready, James .....Monroe, 1885
Macready, John Hart.....Cincinnati, 1901
Maerker, Alfred E. H.....Napoleon, 1892
Main, Oscar Michael.....Toledo, 1901
Malsbary, George E.....Cincinnati, 1897
Mardis, A. W.....Lebanon, 1901
Marquart, Oscar M.....Osborn, 1891
Martin, Thomas Charles.....Cleveland, 1897
Matterson, John D.....Kalida, 1901
Mattoon, F. N.....Plain City, 1881
May, John B.....New Holland, 1892
Maynard, Orlando Thompson.....Elyria, 1892
Means, Charles S.....Columbus, 1896
Means, Will J.....Columbus, 1892
Meek, A. W.....Hollandsburg, 1900
Meek, Robert B.....Fremont, 1902
Melchers, Edward .....Toledo, 1902
Merriam, Walter H.....Cleveland, 1902
Michael, Francis M.....Eaton, 1901
Miller, Aaron T.....Shanesville, 1890
Miller, Delbert J.....N. Benton, 1892
Miller, James Wilson.....Cincinnati, 1901

Miller, John F.....Port Jefferson, 1892
Miller, Naaman C.....Fostoria, 1898
Miller, T. Clark.....Massillon, 1893
Miller, Verlando Z.....Brookville, 1900
Milliken, Dan .....Hamilton, 1879
Millikin, Benjamin L.....Cleveland, 1885
Mills, Charles H.....Toledo, 1888
Mills, Charles D.....Marysville, 1898
Mills, Daniel C.....Lebanon, 1901
Milner, William L.....Wigginsville, 1900
Mitchell, Edwin W.....Cincinnati, 1892
Mitchell, George .....Mansfield, 1897
Moloney, Louis A.....Cincinnati, 1901
Moody, Milo M.....Chatham, 1892
Moody, Price .....Bartlett, 1898
Moore, Clark A.....Cambridge, 1894
Moore, Dickson L.....Columbus, 1895
Moore, Henry M. W.....Columbus, 1894
Moore, John Joseph.....So. Charleston, 1900
Moore, Lyman G.....Kinsman, 1878
Moore, William R.....Swan, 1901
Moots, C. W.....Delphos, 1902
Morehouse, George W.....Sparta, 1890
Morgan, John F.....Jackson, 1895
Morgan, Richard J.....Van Wert, 1895
Morgenroth, Simon .....Bellefontaine, 1901
MORY, John J.....St. Henry's, 1871
MOUNTS, J. L.....Morrow, 1860
Mundhenk, Lewis R.....W. Alexandria, 1899
Munn, Howard E.....Toledo, 1902
Murbach, Edwin A.....Archbold, 1901
Murphy, James W.....Eagle Mills, 1901
Murphy, John W.....Cincinnati, 1892
Murphy, Walter E.....Cincinnati, 1901
MURRAY, Langdon S.....Medina, 1870
Myers, Elmer G.....Canton, 1900
Myers, John Ezra .....Springfield, 1892
Myers, Noah .....Springfield, 1892
Myers, Park L.....Toledo, 1900

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Nelson, Lockhart .....Hillsboro, 1900
Nessley, George B.....Grove City, 1900
Newton, Charles W.....Toledo, 1895

Nicehelser, Orain A.....Mechanicsburg, 1899
Niles, Louis Edward .....New York City, N. Y. 1896
Noble, Herbert E.....Toledo, 1892
Norris, O. L.....Deshler, 1902
Norris, Thomas B.....Alton, 1882
North, John .....Toledo, 1902
Nunemaker, Henry B.....Cleveland, 1880
Nungesser, John J.....Cleveland, 1895

O

Obetz, Nelson .....Columbus, 1895
.O'Connell, Richard F.....Gallipolis, 1901
Odell, Samuel .....Swanton, 1902
Ogden, Charles B.....East Liverpool, 1901
Ohlmacher, Albert P.....Gallipolis, 1895
Oliver, John C.....Cincinnati, 1892
Oster, L. W.....Cleveland, 1892
Overly, John E.....Columbus, 1888
Owens, John Robert.....Wayland, 1901

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PALMER, Chauncey D.....Cincinnati, 1871
Parent, William H.....Lima, 1902
Parke, Benjamin R.....Wellsville, 1900
Parker, Charles G.....Gallipolis, 1901
Parker, Edward Wilson.....Gallipolis, 1899
Parry, John R.....Woodsfield, 1898
PATERSON, A. V.....Mansfield, 1861
Patterson, Clifton L.....Dayton, 1902
PEARCE, Enoch .....Steubenville, 1859
Pearson, Herbert R.....West Milton, 1900
Pennell, William W.....Fredericktown, 1884
Peskind, Arnold .....Cleveland, 1892
Peterson, Herman D.....Kelly's Island, 1902
Petitt, Richard R.....Dayton, 1885
Philips, William S.....Belle Centre, 1895
Phillips, David P.....Kenton, 1902
Phillips, Merton O.....Fremont, 1902
Phillips Percy T.....Bellevue, 1902
Plummer, Frank E.....Coalton, 1896
Porter, Edward H.....Tiffin, 1902
Porter, William D.....Cincinnati, 1892
Potter, Samuel B.....Fredericktown, 1892
Powell, William S.....Defiance, 1881
Pratt, Lester C.....Bellefontaine, 1895

Pressey, Austin J.....Cleveland, 1902
Price, Henry H.....Cambridge, 1899
Probst, C. O.....Columbus, 1892
Prolzman, Edwin S.....Kenton, 1901
Pugh, Frank H.....Bryan, 1892
Pumphrey, Rezin J.....Massillon, 1895

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Quinn, Allen T.....Wilmington, 1881

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Ramsey, William T.....Cambridge, 1899
Ranchous, Walter E. M.....Columbus, 1898
Rankin, T. W.....Columbus, 1881
Ransohoff, Joseph .....Cincinnati, 1879
Ranz, William E.....Sandusky, 1902
Rardin, Joseph S.....Portsmouth, 1892
Ravogli, Augustus .....Cincinnati, 1892
Ray, Jacob Benson .....Omega, 1896
Ray, James B., Jr. .....Scioto, 1898
Ray, Joseph H.....Coalton, 1895
Ray, Victor .....Cincinnati, 1900
Rea, Edwin H.....Irondale, 1897
REAMY, Thaddeus A.....Cincinnati, 1855
Reed, Charles A. L. .....Cincinnati, 1881
Reed, Calvin H.....Toledo, 1873
REED, R. C. Stockton.....Cincinnati, 1867
Reed, R. Harvey.....Rock Springs, Wyo., 1884
Reed, Thomas Jefferson.....Massillon, 1880
Reemelin, Rudolf H.....Cincinnati, 1892
REEVE, John C.....Dayton, 1861
Reeve, John C., Jr.....Dayton, 1892
Reilly, Daniel G.....Dayton, 1901
Reinhart, Henry D.....Covington, 1901
Reynolds, Robert D.....Green Springs, 1897
Rheinfrank, John H.....Perrysburg, 1886
Rheinfrank, William H.....Perrysburg, 1895
Rhu, August .....Marion, 1886
Rhu, Herman S.....Marion, 1900
Ridgeway, Nathaniel B.....Galion, 1878
Riggs, John U.....Bryan, 1873
Richardson, Alonzo B.....Washington, D. C. 1891
Ricketts, B. Merrill.....Cincinnati, 1882
Ricketts, Edwin .....Cincinnati, 1884
Robb, Hunter .....Cleveland, 1897

Roberds, Thomas W.....Bell, 1892
Robeson, Doravan .....Greenville, 1900
Rodebaugh, Henry A.....Marysville, 1890
RODGERS, J. H.....Springfield, 1859
Rogers, Henry W.....Cleveland, 1892
Rogers, J. H.....Louisville, 1889
Rogers, William K.....Columbus, 1895
Rohrs, Henry F.....Napoleon, 1902
Root, Henry A.....Toledo, 1892
Rosengrant, Thomas S.....Barnesville, 1894
Rosenwasser, Marcus .....Cleveland, 1880
Row, George T.....Circleville, 1880
Rudy, Albert S.....Lima, 1892
Rush, Andrew W.....Greenville, 1900
Russell, Edwin S.....Alliance, 1880
Russell, George C.....Cleveland, 1892
Russell, John E.....Mt. Vernon, 1897
Rutter, H. C.....Columbus, 1897
Ryan, Michael .....Dayton, 1899

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Sabine, Thomas M.....Warren, 1893
Saffin, Wilson .....Carthage, 1901
Sager, Benson E.....Cleveland, 1897
Sager, Joseph .....Celina, 1882
Sallume, Majib N.....Toledo, 1902
Sampson, George W.....Upper Sandusky, 1895
Sanders, Addison F.....Cincinnati, 1899
Sanders, Tennyson .....Leesburg, 1901
Santee, Leon R.....Marlboro, 1885
SATTLER, Robert .....Cincinnati, 1872
Sawyer, John P.....Cleveland, 1892
Schnetzler, August C.....Toledo, 1899
Schnetzler, H. Marcus.....Toledo, 1874
Schnider, William C.....Cincinnati, 1901
Schoepfle, Henry C.....Sandusky, 1900
Schooley, Lindley .....Belmont, 1894
Schutzbach, John C.....Strasburg, 1892
Schwab, Louis .....Cincinnati, 1892
Scott, Nathan S.....Cleveland, 1892
Scott, William Alfred.....Swanton, 1878
Scott, Xenophon C.....Cleveland, 1874
Sears, Oscar T.....Toledo, 1892
Sewell, Silas G.....Greenville, 1892

Shalliott, Peter ..... Winesburg, 1891
Sharp, B. M. ..... Sidney, 1885
Sharp, C. Edwards ..... Columbus, 1900
Sharp, Henry J. ..... London, 1899
Shaw, William E. ..... Cincinnati, 1892
Sheldon, S. B. ..... Five-Mile, 1882
Shephard, Arthur F. ..... Dayton, 1902
Sherman, Harris G. ..... Cleveland, 1892
Shie, David P. ..... Fredericksburg, 1897
Shriner, Pickney D. ..... Columbus, 1895
Silbaugh, John J. ..... Lancaster, 1899
SILVER, David R. ..... Sidney, 1870
SINNET, Edwin ..... Granville, 1850
Skeel, Roland E. ..... Cleveland, 1892
Slagle, Charles D. ..... Centerville, 1901
Slocum, Charles E. ..... Defiance, 1874
Smead, Herbert E. ..... Toledo, 1901
Smith, B. Decatur ..... Cincinnati, 1901
Smith, Charles N. ..... Toledo, 1887
Smith, Charles W. ..... Cleveland, 1897
Smith, David M. ..... Newark, 1895
Smith, Frederick K. ..... Warren, 1897
Smith, Harvey H. ..... Sharonville, 1901
Smith, John M. ..... New Philadelphia, 1884
Smith, Mourice ..... Massillon, 1902
Smith, W. W. ..... Portsmouth, 1900
Smith, William G. ..... Ravenna, 1885
Snodgrass, Jesse ..... Kenton, 1897
Snodgrass, William C. ..... Kenton, 1901
SNYDER, Daniel J. ..... Scio, 1850
Sonders, Berton A. ..... Winterset, 1899
Souder, Robert L. ..... Ada, 1892
Souders, Samuel ..... Dean, 1879
Southard, John Q. ..... Marysville, 1882
Speer, Henry Newton ..... Cambridge, 1900
Speidel, Charles G. E. ..... Cincinnati, 1892
Spencer, Ezra R. ..... Doylestown, 1885
Spenzer, John G. ..... Cleveland, 1896
Spratt, William R. ..... Malvern, 1902
Sproull, Oliver T. ..... Bentonville, 1901
Spurney, Albert F. ..... Cleveland, 1897
Stamm, Martin ..... Fremont, 1891
STANSELL, Joseph A. ..... Forrest, 1866
Stanton, Byron ..... Cincinnati, 1892

Stark, Sigmar .....Cincinnati, 1892
Starmen, Albert A.....Danville, 1901
Steel, Robert G.....Melmore, 1897
Stein, George S.....Columbus, 1888
Steiner, David W.....Lima, 1890
Stephenson, Young .....Georgetown, 1892
Stevens, Edward S.....Lebanon, 1886
Stevenson, George W.....Cleveland, 1892
Stewart, Clarence E.....Toledo, 1902
Stewart, John O.....Cedarville, 1892
Stewart, Robert W.....Cincinnati, 1892
Stewart, Thomas H.....Church Hill, 1877
Stewart, William D.....Toledo, 1887
Stierwalt, William L.....Fremont, 1902
Stillman, Frank L.....Columbus, 1895
Stimson, Charles H.....Newark, 1894
Stinchcomb, William Gale.....Bellefontaine, 1900
Stitt, John J.....Rising Sun, 1899
St. John, Charles S.....Bowling Green, 1902
STOCKSTILL, J. N.....New Carlisle, 1857
Stockton, George .....Columbus, 1895
Storey, William .....Castalia, 1884
Stovering, Frank A.....Cleveland, 1901
Straight, Howard S.....Cleveland, 1892
Strausz, Philip Hurt.....Toledo, 1901
Stricker, Louis .....Cincinnati, 1895
Stucky, John G.....Walnut Creek, 1897
Stueber, Frederick G.....Lima, 1902
Suker, George F.....Chicago, Ill. 1901
SWENEY, Robert L.....Marion, 1859
Swigart, Robert E.....Tiffin, 1902
Swisher, Argus B.....Marysville, 1898
Sykora, Joseph .....Cleveland, 1892
Sylvester, John E.....Wellston, 1898

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Talley, Charles F.....Powell, 1895
Tangeman, Charles W.....Cincinnati, 1888
Tarbell, Robert C.....Columbus, 1902
Tate, Magnus A.....Cincinnati, 1901
Tauber, Bernard .....Cincinnati, 1899
Taylor, Clovis M.....Columbus, 1894
Taylor, Fred C.....Cleveland, 1897
Taylor, Sterling B.....Columbus, 1900

Taylor, Walter C.....Kimbolton, 1901
Taylor, William H.....Cincinnati, 1874
Teachnor, Wells .....Columbus, 1899
Telfare, George M.....Bloomington, 1884
Thomas, Benjamin A.....Rushville, 1899
Thompson, Charles A.....Raymond, 1899
Thompson, Fred E.....Marengo, 1895
Thompson, J. A.....Cincinnati, 1892
Thompson, Samuel R. .....Uhrichsville, 1892
Thompson, William E.....St. Clairsville, 1897
Thompson, W. R.....Troy, 1902
Thorn, Samuel S.....Toledo, 1873
Thrasher, Allen B.....Cincinnati, 1886
TICHENOR, E. J.....Lebanon, 1868
Timberman, Andrew .....Columbus, 1898
Titlow, Bennetta D.....Springfield, 1892
Tobey, Henry A.....Toledo, 1878
Todd, Joseph H.....Wooster, 1892
Tower, Bryant Mabbett.....Conneaut, 1892
Towslee, Lillian G.....Cleveland, 1897
Trimble, Charles E.....Crestline, 1892
Trimble, Rodney T.....New Vienna, 1887
Trout, J. Francis.....Lancaster, 1895
Trush, Jacob .....Cincinnati, 1892
Tuller, Willis M.....Bowling Green, 1902
Tydings, Oliver .....Piqua, 1892

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Upham, John H. J.....Columbus, 1900

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Vail, Derrick T.....Cincinnati, 1892
Vance, Allen H.....Springfield, 1899
VANDERVOORT, J. W.....Harveysburg, 1864
Van Fossen, Jesse A.....Columbus, 1901
VANNATA, E. .....Fultonham, 1855
Van Nette, Wesley .....Poplar, 1892
Van Note, William B.....Lima, 1902
Vigor, Frederick A.....New Dover, 1884
Voltz, Ernest C.....Chili, 1898
Vorhes, Burnett C.....Albany, 1895

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Wagenhals, Frank S.....Columbus, 1885
Walker, Alonzo B.....Canton, 1882

Walker, August Rudolph.....Cincinnati, 1900
Walker, Edward W.....Cincinnati, 1900
Wall, James J.....Mallet Creek, 1897
Wallace, Abraham H.....Coshocton, 1898
Ward, Clarence S.....Warren, 1875
Warner, Charles J.....Congress, 1892
Warner, Frank .....Columbus, 1884
Waters, George M.....Columbus, 1896
Watkins, Charles D.....Etna, 1898
Watson, James L., Jr.....Toledo, 1901
Weamer, Phillip F.....Coldwater, 1900
WEAVER, James M.....Dayton, 1865
Weaver, Walter B.....Cincinnati, 1902
Webb, Dudley .....Cincinnati, 1901
Weed, Theodore A.....Cleveland, 1880
Weeks, Dana Oliver.....Marion, 1900
Weitz, Joseph A.....Montpelier, 1902
Welch, Absalom J.....Mt. Sterling, 1890
Wendel, Henry Charles.....Cincinnati, 1901
Wenning, William H.....Cincinnati, 1892
West, J. Park.....Bellaire, 1892
West, Thomas J.....Tiffin, 1875
Westbrook, Albert Ernest.....Ashley, 1900
Whitacre, Horace J.....Cincinnati, 1901
White, David Kirk.....Cleveland, 1899
Whitmar, Joel E.....Charm, 1892
Whittaker, Harvey W.....Columbus, 1895
Wickerham, James O.....Seamon, 1901
Wilcox, Starling S.....Columbus, 1895
Williams, Brady O.....Martins Ferry, 1891
Williams, Francis H.....Portsmouth, 1901
Williams, John G.....Westwood, 1901
Williams, Salathiel W.....Gallipolis, 1901
Williams, Thomas Benton.....Cleveland, 1886
Williams, W. E.....Jackson, 1895
Williamson, Albert M.....Dayton, 1892
Williamson, Joseph C.....Sciotoville, 1901
Williard, George P.....Tiffin, 1875
Willson, Charles W.....Idaho, 1895
WILLSON, William H.....Greenfield, 1865
WILSON, DeWitt C.....Ironton, 1872
Wilson, Edwin F.....Columbus, 1899
Wilson, Edmon J.....Columbus, 1895
Wilson, Milo .....Athens, 1898

Wilson, S. S.....Xenia, 1899
Winders, Frank .....Columbus, 1896
Wirt, William E.....Cleveland, 1891
Withrow, John M.....Cincinnati, 1892
Wolfe, Albertus C.....Columbus, 1896
Wolfstein, David I.....Cincinnati, 1900
Wood, John S.....Collingwood, 1880
Wood, William H.....Smithfield, 1892
WOODRUFF, L. .....Alton, 1867
WOODS, Joseph T.....Washington, D. C. 1862
Wren, William G.....Columbus, 1898
Wright, James H.....New Lexington, 1894
Wright, John A.....Toledo, 1892
Wright, John W.....Columbus, 1885
Wright, Samuel St. John.....Akron, 1880
Wright, Thomas M.....Troy, 1891

Y

Yates, Earl A.....Kirkwood, 1902
Yeomans, William L.....Bucyrus, 1902
Yocum, Lincoln A.....Wooster, 1897
Youmans, Thomas Grant.....Columbus, 1900
Young, Downing Howard.....Wakeman, 1892
Young, George M.....Toledo, 1902
Young, Nelson H.....Toledo, 1902

Z

Zenner, Phillip .....Cincinnati, 1882
Zimmerman, Harry A.....Youngstown, 1892
Zinke, E. Gustave.....Cincinnati, 1892

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Dunham, Kennon, N. W. cor. Auburn ave. and McMillen st.
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Fihe, Clement C., 1205 Walnut.
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Forcheimer, W. F., Ortiz Bldg.
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Granger, Robert, Garfield Pl.
Green, Myron D., 3015 W. 6th.
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Griess, Walter R., 14 E. 7th.
Grimes, S. B., 28 W. 7th.
Grimm, Adolph, 49 E. McMicken.
Grothaus, J. B., 1623 Baymiller.
Gunckel, J. S., The Groton.
Haeusser, Gustav, 793 E. McMillan.
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Haile, Geo. N. E. C., 3rd and Broadway.
Handley, D. C., 36 Garfield Pl.
Haines, W. D., 1606 Freeman.
Hall, Rufus B., 628 Elm.
Hall, Jos. W., 308 Pike.
Hall, Jos. A., 2513 Auburn ave.
Hamma, C. B., Western and Dayton.
Hampton, Nellie B., 40 E. McMillan.

Harff, B. G., 2843 Woodburn.
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Harmon, F. W., Supt. Longview Hospital, Carthage.
Harris, James, 286 W. McMicken.
Harris, W. C., The Groton.
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Hays, T. W., 18th and Vine.
Heady, J. F., Glendale.
Heidingsfield, M. L., 22 W. 7th.
Heise, O. N., 16 Garfield Pl.
Held, H. P., 1901 Vine.
Hellman, F. F., 1327 Broadway.
Hendley, F. W., 785 E. McMillan.
Heyl, Ashton B., Ft. Thomas, Ky.
Hillkowitz, Wm., 704 Race.
Hinckley, H. D., 213 W. 9th.
Hines, H. H., 34 Garfield Pl.
Hocker, Elizabeth, 1032 Wesley.
Holmes, C. R., 8 E. 8th.
Holt, O. P., 134 W. 9th.
Hoppe, H. H., 32 Garfield Pl.
Hottendorf, L. P., 810 Richmond.
Hulton, P. C., Ft. Thomas, Ky.
Hydman, J. G., 22 W. 9th.
Iglauer, Sam'l, 22 W. 7th.
Ihle, Clarence, 22 W. 7th.
Iliff, Chas. E., 122 W. 7th.
Ingram, Robert, 510 Clark.
Ingalls, H. A., 628 Elm st.
Isham, A. B., 849 Oak st.
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Johnston, E. S., 412 Everett.
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Jones, R. C., 2373 Park.
Jones, W. E., 911 E. McMillan.
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Kendig, W. C., Longview Hospital, Carthage.
Khuon, Edward, 1930 Central.
Kiely, W. E., 420 Broadway.
King, J. R., 1268 E. 3rd st.
Knight, A. L., Madisonville.
Knight, Wm., 111 Garfield Pl.
Koehler, Max, 124 W. 9th.
Kramer, S. P., 21 Garfield Pl.
Kreidler, A. G., 1101 Harrison.
Krieger, G. L., Madisonville.
Krouse, L. J., The Groton.
Kugler, Frank E., 3309 Price.
Kuntz, John C., 511 Broadway.
Lamb, F. H., City Hospital.
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Landy, Edwin F., 3015 Colerain.
Langdon, F. W., 5 Garfield Pl.
Lehman, B. F., Home City.
Lewis, W. E., 409 E. 5th.
Lyle, B. F., 2302 W. 8th st.
Maloney, J. J., 427 Clark.
Mackenzie, J. C., 20 W. 7th.
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Macready, J. H., 608 Delhi.
Malsbary, Geo. E., 1631 Sycamore.
Marcus, Jos. C., 411 W. 8th.
Marcus, J. E., 411 W. 8th.
Marsh, F. O., 1616 Main.
Marxmiller, G. H., 9th and Washington, Newport, Ky.
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McClure, Chas. R., 122 Garfield Pl.
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McKee, E. S., 10 W. 7th.
Mente, W. F., 1639 Sycamore.
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Mitchell, Giles S., 10 W. 7th.
Mithoefer, Wm., 321 Broadway.
Molloy, J. J., 717 Madison, Covington, Ky.

Moloney, L. A., 731 W. 5th.
Morgan, Thos. J., 1811 Madison, Covington, Ky.
Morgenstern, A. 124 W. 9th.
Moss, E. H., 504 E. Liberty.
Muhlberg, W. H., 5 Garfield Pl.
Murnan, J. R., 1005 Madison, Covington, Ky.
Murphey, A. D., 131 Garfield Pl.
Murphy, W. E., 628 Elm.
Murphy, John W., The Groton.
Nelson, Lockhart, 22 W. 7th.
Nickels, Samuel, 1406 John.
Oliver, J. C., 628 Elm.
Orr, Geo. B., 423 E. 4th.
Owen, Wm. O., Manila, P. I.
Palmer, C. D., Main and Forest.
Paul, Charles M., 36 Garfield Pl.
Pearce, C. T., The Groton.
Phelps, A. V., 510 W. 7th.
Phythian, J. L., 225 E. 6th, Newport, Ky.
Pieck, Chas. S., Covington, Ky.
Poole, A. C., 2913 Woodburn.
Porter, W. D., 2531 Gilbert.
Pusklitsch, E. O., 3142 Woodburn.
Prugh, G. W., 2101 Eastern.
Querner, L. A., 1130 Race.
Rachford, B. K., 323 Broadway.
Ramsey, Allen, Ortiz Bldg.
Ransohoff, Joseph, 706 Walnut.
Ratterman, B. J., 1532 Elm.
Ratterman, Frank L., 2419 Ohio.
Ravogli, A., 5 Garfield Pl.
Ray, Victor, The Groton.
Reamy, T. A., Reading Road and Oak.
Reed, Chas. A. L., The Groton.
Reed, J. G., The Groton.
Reemelin, R. H., 36 Garfield Pl.
Renneker, A. P., 1550 Baymiller.
Reynolds, C. W., 48 W. 4th., Covington, Ky.
Ricketts, B. M., 4th and Broadway.
Ricketts, E. S., 408 Broadway.
Riley, Estella M., 728 W. 7th.
Rothenberg, S., 626 W. 8th.
Rowe, James W., 3514 Reading Road, Avondale.
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Saffin, Wilson, Carthage.
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Sanfield, Bernard, 20 W. Elder.
Sattler, Eric E., 109 Garfield Pl.
Sattler, Robt., The Groton.
Savage, W. E., 215 W. 9th.
Scheerer, Frank, 1812 Baymiller.
Schenck, W. Edwards, 5 Garfield Pl.
Schmidt, T. W., 116 E. 9th.
Schmidter, W. C., Linn and Findlay.
Schorr, P. E., 2203 W. Clifton.
Schrickel, L. C., 1631 Walnut.
Schultz, Wm. F., 11th & Russell, Covington, Ky.
Schwab, Louis, 1641 Blue Rock.
Schwagmeyer, A. C., 1909 Elm.
Seeley, W. W., 4th and Broadway.
Shaller, J. M., 309 Webster.
Shaw, W. E., 2974 Colerain.
Shields, Edward H., 5 Garfield Pl.
Shields, Percy, 5 Garfield Pl.
Singleton, J. B., 10 E. 9th.
Smith, E. O., 1223 Walnut.
Smith, B. D., 901 W. 9th.
Solar, F. M., 1741 Westwood.
Southgate, Louise, Glenn Bldg.
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Stanton, Byron, 931 Dayton.
Stapleford, A. D., 2647 Western.
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Stark, Sigmar, 13 E. 8th.
Stevenson, J. W., U. S. Marine Hospital.
Stewart, Robert W., Ortiz Bldg.
Stine, F. A., 225 E. 6th, Newport, Ky.
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Sudhoff, Geo. T., 1414 Elm.
Swartsel, S. C., 1786 Elmore st.
Taft, J., 628 Elm.
Taft, W., 628 Elm.
Tangeman, C. W., 20 W. 9th.
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Tate, Ralph B., 361 E. 3rd.
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Taylor, Wm. H., 553 W. 7th
Taylor, Wm. J., 553 W. 7th.
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Hamann, C. A., 661 Prospect.
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Heath, J. A., 10 Marquette.
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Heimlich, D., 521 Woodland.
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Herrick, F. H., 43 Cutler.
Herrick, H. B., 2531 Euclid.
Herrick, H. J., Jr., 367 Erie.
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Holliday, B. W., Euclid and Russell.
Holliday, W. W., 30 Miles Park.
Holmes, G., 688 W. Madison.
Hoover, C. F., Rose Bldg.
Hosick, W. A., 1613 Woodland.
Houck, E. O., 361 Dunham.
House, A. F., 1051 Superior.
Howard, W. T., Jr., 88 Dorchester.
Howard, A. B., Cleveland State Hospital.
Howland, A. P., 63 Livingston.
Humiston, W. H., Rose Bldg.
Hutchins, F. C., Jennings ave. (The Leighton.)
Hyde, W. H., 247 W. Madison.
Iddings, Geo. S., Caxton Bldg.
Ingersoll, J. M., 50 Euclid.
James, W. S., 1519½ Lorain.
Jones, J. A., 424 Willson.
Jones, J. D., 1635 Harvard.
Jones, N. M., 162 Taylor.
Jenks, W. O., Nottingham.
Kahn, M., 698 Woodland.
Kaestlen, S. E., 50 McLean.
Kelley, S. W., 1150 Superior.
Kelly, J. F., Cleveland State Hospital.
Kerruish, M. G., 1014 Euclid.
Kinnaman, C. L., 1474 Cedar.
Knowlton, W. A., 530 Jennings.
Kofron, J. V., 1560 Broadway.
Kopfstein, F. T., 2300 Superior.
Krause, B., 1465 Willson.
Krebs, P. H., 1007 Pearl.
Ladd, L. W., 1527 Euclid.
Laffer, W. B., 962 Willson.
Large, S. H., New England Bldg.
Lauder, E. S., Osborn Bldg.
Lawlor, B. J., 1419 Woodland.
Lee, H. J., 73 Tilden.
LeFevre, W. I., Rose Bldg.
Leick, G. F., 503 Prospect.
Lenker, J. N., Osborn Bldg.
Lewis, J. M., Rose Bldg.
Lincoln, Wm. R., Osborn Bldg.
Lincoln, Walter R., Osborn Bldg.
Lichty, M. J., Genesee and Hough.
Linn, F. W., 1111 Lorain.
Linden, W. E., So. Brooklyn.
Lowenthal, M., 1200 Case.
Lower, W. E., Osborn Bldg.
Lowman, J. H., 441 Prospect.
Lucas, V. C., 1158 Pearl.
Lucas, W. H., 853 Lorain.
Luck, H. C., 870 Hough.
Lueke, A. W., Scofield Bldg.
Lueke, E. H., Scofield Bldg.
MacTaggart, R. G., 436 Pearl.
McGee, J. B., 1405 Woodland.
McNamara, A. J., 176 Euclid.
McMichael, J. C., Glenville.
McPeck, E. E., Hough ave.
Mabley, H. C., 2088 Euclid.
Martin, T. C., 729 Case.
Marvin, A. H., 106 Euclid.
Maschke, A. F., 1200 Case.
Mead, A. H., 25 Brainard.
Merriam, W. H., Osborn Bldg.
Meredith, W. G., 2238 Euclid.
Metzenbaum, M., 1220 Case.
Miller, A. H., 997 Pearl.
Milliken, B. L., 278 Prospect.
Mizer, F. J., 797 Lorain.
Moore, J. M., 1960 St. Clair.
Moorehouse, G. W., 842 Logan.
Morton, F. J., 962 Lorain.
Mueller, O., 509 Pearl.
Nachtigall, B. A., 1207 Pearl.
Nash, A. C., 642 Hough.
Nelson, C. F., 604 New England Bldg.
Norton, F. B., 150 Kennard.
Nungesser, J. J., 97 Lyman.
Nydegger, R., 166 Jennings.
Ormsby, H. B., Central and Brownell.
Osborn, W. O., Osborn Bldg.
Oster, L. W., 1261 St. Clair.
Oswald, B. F., 2010 Detroit.
Oakley, R. G., 855 Rose Bldg.
Parke, M. J., 331 Prospect.
Parker, C. B., 425 Euclid.
Parker, H., Lakeside Hospital.
Paulin, N. O., 962 Willson.
Pav, A., 1574 Willson.
Payne, F. A., 616 Willson.
Perrier, J., 1014 Willson.

Perkins, R. G., 1527 Euclid.
Peskind, A., 1354 Willson.
Peskind, Sam., 1354 Willson.
Phillips, W. H., 739 Superior.
Pollock, R., 558 Hough.
Pope, Carlyle, Rose Bldg.
Povey, W. J., 693 Hough.
Powell, H. H., 467 Prospect.
Pressy, A. J., 900 Fairmount.
Proctor, J. H., Lakeside Hospital.
Propper, I. J., 368 Woodland.
Radcliffe, G. H., 24 Mather.
Ranney, A. J., Lakeside Hospital.
Rayl, W. L., Doan and Hulda.
Rhodes, E. B., 3425 Euclid.
Riegelhaupt, S., 659 Scovill.
Riley, J. A., 1314 Cedar.
Robb, Hunter, 702 Rose Bldg.
Rogers, H. W., 128 Franklin.
Rosenberg, E., 1597 Woodland.
Rosenwasser, M., 722 Woodland.
Rosewater, N., 1351 Willson.
Russell, G. C., Williamson Bldg.
Sager, B. E., 243 Crawford.
Sawyer, J. P., Rose Bldg.
Sawyer, P. H., 54 Streator.
Schmoldt, F. J., 1696 Superior.
Schnee, R. G., 2004 Superior.
Scott, N. S., 531 Prospect.
Season, E. H., 2238 Euclid.
Sechrist, C., Rose Bldg.
Selleck, S. L., 1448 Willson.
Shackleton, W. E., Osborn Bldg.
Sherman, H. G., Rose Bldg.
Shirkey, U. S. L., 1357 Lorain.
Siegelstein, L. E., 333 Woodland.
Sihler, C., 1 Franklin Ct.
Simpson, A. J., 2618 Broadway.
Sipher, J. N., 76 Euclid.
Skeel, A. J., 1495 Pearl.
Skeel, R. E., 1160 Pearl.
Smigel, P. S., 2086 Broadway.
Smith, A. E., 726 E. Prospect.
Smith, C. W., 260 Euclid.
Smith, D. B., 315 Arcade.
Smith, G. S., 260 Euclid.
Smith, J. R., 396 Jennings.
Smith, J. T., Collinwood.
Snow, L. B., 122 Euclid.
Snow, C. A., Pearl cor. Archwood.
Snow, M., 143 Clinton.
Sollmann, T., W. R. U. Medical College.
Somerville, G. H., 2549 Broadway.
Spence, H. L., 1160 E. Madison.
Spenzer, J. G., Rose Bldg.
Spurney, A. F., 864 Woodland.
Steiner, A., Osborn Bldg.
Stephan, J. F., 57 Knox.
Stepp, M. D., 7 Minnesota.
Stern, W. G., 516 Rose Bldg.
Steuer, D. B., 465 St. Clair.
Steuer, J. C., 3 Woodland.
Stewart, G. N., W. R. U. Med. College.
Stillman, G. B., 1318 Cedar.
Stevenson, G. N., 180 Oakdale.
Stoskopf, G., 645 Jennings.
Stotter, J., Rose Bldg.
Stovering, F. A., 334 Pearl.
Straight, H. S., 321 Hickox Bldg.
Stuart, C. C., 408 Jennings.
Sykora, J., 1449 Broadway.
Suchy, F. H., Bertram and Central.
Sunkle, R. H., Pearl and Clark.
Taylor, F. C., Pearl and Franklin.
Thomas, J. J., 156 Crawford.
Thomas, O. T., 50 Euclid.
Tierney, J. S., Rose Bldg.
Towslee, L. G., Osborn Bldg.
Tripp, I. A., Nottingham.
Updegraff, R. H., City Hospital.
Upson, G. D., Hickox Bldg.
Upson, H. S., 514 New England Bldg.
Wagner, H. G., Rose Bldg.
Waite, F. C., W. R. U. Medical College.
Walker, E. S., E. Prospect and Willson.
Warner, M. F., New England Bldg.
Warner, W. C., 739 Hough.
Waugh, J. M., 3584 Euclid.
Weber, W. C., Osborn Bldg.
Webster, S. J., So. Brooklyn.
Weidman, Ethel M., Detroit and Highland.
Weisenberg, S. A., 139 Putnam.
Welty, C. F., Osborn Bldg.
Wheelock, L. A., 2 Hazel.
White, D. K., Osborn Bldg.
Wier, W. H., 260 Euclid.
Williams, C. D., Lakeside Hospital.

Williams, T. B., 145 Quincy.
Wirt, W. E., 477 Prospect.
Wood, J. S., Collinwood.
Wood, W. H., 526 Rose Bldg.
Woodford, E. W., 737 Detroit.
Wooldridge, C. W., 933½ Woodland.
Yarian, N. C., 1131 Detroit.

NON-RESIDENT MEMBERS

Adams, C. W., Jefferson.
Amidon, H. N., Painesville.
Bahrenburg, L. P. H., Marine Hospital, Chicago (services).
Bauer, M. M., Lake, O.
Bell, W. H., Bellevue.
Bourn, E. L., Brecksville.
Boyd, J. P., Akron.
Bozovsky, V. D., Monroeville.
Brant, A. C., Canton.
Brashear, B. B., Atlantic City, N. J.
Breck, T. B., Redridge, Mich.
Bunce, W. C., Oberlin.
Cleaver, J. V., Akron.
Cox, S. S., Lorain.
Cotton, C. E., Black Mountain, N. C.
Cozad, H. I., 600 Hamilton Bldg., Akron.
Cushing, C. H., Elyria.
Davidson, S. M.,
Drysdale, H. H., Lodi.
Eldridge, F. A., Berlin Heights.
Everhard, N. S., Wadsworth.
Eyman, H. C., Massillon State Hospital.
Fraunfelter, J., Canton.
Fitzgerald, G. H., Albuquerque, New Mexico.
Gamble, R. V., New London.
Gardner, J. F., West Brookfield.
Garver, A. N., Lorain.
Gehring, W. J., Portland, Me.
Gill, Geo., North Ridgeville.
Guthrie, C. C., Columbia, Mo.,
Hall, H. L., North Amherst.
Handler, S., 670 N. St. Paul, Rochester, N. Y.
Hannum, E. S., Mantua Station.
Hart, Wm. E., Elyria.
Hawley, E. N., Norwalk.
Hiddleson, C. S., Atwater.
Hine, G. W., Berlin Heights.
Hopkins, A. D., Middlefield.
Hoover, D. E., Warren.
Humphrey, C. M., Akron.
Hutton, C. F., Minerva.
Ingersoll, A. J., Mentor.
Jacobs, H. H., Akron.
Jameson, G. C., Oberlin.
Johnson, M. H., Collins.
Jones, D. K., Canal Fulton.
Jones, D. J., Lisbon.
Kinnaman, R. C., Ashland.
Lauterman, G. S., Bellevue.
Leet, W. H., Conneaut.
Leitch, A. J., Niles.
Leonard, F. E., Oberlin.
Leroy, B. R., Chagrin Falls.
Love, M. J., Bloomingville.
Lowe, J. W., Mentor.
McVeigh, J. A., 29 Smith av., Detroit, Mich.
Manley, O. T., Garrettsville.
Maynard, O. T., Elyria.
Meriam, D. J., Painesville.
Miller, M. F., Wadsworth.
Myers, E. G., Canton.
Oaks, I. N., N. Ridgeville.
Ohlmacher, A. P., Gallipolis.
Page, H. M., Hiram.
Post, S. B., Canton.
Rankin, J. C., Akron.
Reynolds, R. D., Green Springs.
Reich, Leo, 442 Hamilton Bldg., Akron.
Rhu, Aug., Marion.
Russell, J. E., Mt. Vernon.
Schilling, Chas. E., Canton.
Schuffell, H. M., Canton.
Searl, W. A., Cuyahoga Falls.
Seiddell, R. R., Bedford.
Shane, G. A., Waynesburgh.
Smith, F. K., Warren.
Smith, J. T., Collinwood.
Stall, A. A., Barberton.
Stamm, M., Fremont.
Stevenson, M., Akron.
Stoll, C. N., Dover.
Tanner, C. H., Willoughby.
Tidball, A. H., Garrettsville.
Todd, G. M., Akron.

Tressell, J. H., Alliance.
Tuttle, C., Berlin Heights.
Vance, A. H., Springfield.
Wagoner, S. S., Johnson.
Walker, A. B., Canton.
Ward, C. S., Warren.
Webster, A. M., Lorain.
Wenner, H. L., Tiffin.
Wheatley, W. E., South Lorain.
Whelan, R. E., Youngstown.
Williams, C. C., Niles.
Woodward, R. N., Washington, D. C.
Woessner, N. E., Huron.
Young, A. H., Washington, D. C.
Young, D. H., Chicago.
Zimmerman, H. O., Youngstown.

ACADEMY OF MEDICINE, DAYTON.

T. E. Marshall.....President.
W. A. Ewing.....Vicepresident.
W. A. Burns.....Treasurer.
Frederick C. Weaver.....Secretary.

MEMBERS

Agnew, Wm.
Bohlender, E. E.
Breidenbach, C. H.
Burns, W. A.
Coy, M. E.
Dale, Geo. P.
Delscamp, W. H.
Dunham, A. H.
Ewing, W. A.
Gaugler, R. S.
Gilbert, T. D.
Gohn, Geo. D.
Greip, O. C.
Gunckel, P. L.
Hahne, H. A.
Haning, H. C.
Huston, E. M.
Lane, A. H.
Marshall, T. E.
Marshall, W. C.
Moore, J. W.
Pennywitt, R. C.
Porter, Matthew.
Prather, W. F.
Roehm, Wm.
Sanz, Geo.
Schuster, George R.
Stewart, E. A.
Taylor, Wilfred.
Thomson, F. S.
Weaver, Fred'k C.
Werthner, Jos.

ADAMS COUNTY MEDICAL SOCIETY.

Auxiliary since 1888 Annual Meeting in June

J. O. Wickerham.....President.
O. W. Robe.....Vicepresident.
O. T. Sproull.....Secretary.
E. M. Gaston.....Treasurer.
Board of Censors—W. B. Loney, T. C. Crawford, C. S. Carboy.

MEMBERS

Berry, J. S., Peebles.
Bunn, Jas. W., West Union.
Carboy, C. S., Winchester.
Coleman, W. K., West Union.
Connell, W. R. S., Manchester.
Coulthar, W. E., Williamsburg, Brown Co.
Crawford, T. C., Dunkinsville.

Downing, M. L., Rockford, Mercer Co.
Edgington, C. W., West Union.
Ellis, W. C., Portsmouth.
Ellison, J. N., Sardinia, Brown Co.
Gaston, E. M., West Union.
Guthrie, J. W., Manchester.
Irwin, R. W. E., Manchester.
Jordon, J. D., Manchester.
Kirkpatrick, O. B., Cherry Fork.
Littleton, R. Y., Stout.
Lockhart, J. M., Eckmansville.
Loney, W. B., West Union.
McCormick, Geo. D., Wainsley.
McCreight, G. C., Tranquility.
Noble, A., Winchester.
Purdy, R. W., Bradyville.
Sproull, O. T., West Union.
Stephenson, R. A., Manchester.
Stevenson, Titus, Cherry Fork.
Thomas, G. F., Peebles.
Wickerham, J. O., Seaman.
Wikoff, C. T., Decatur.
Wittenmeyer, J. M. Peebles.

Regular meetings—Third Wednesday of April, June, August and October.

ALLEN COUNTY MEDICAL SOCIETY.

A. W. Bice.....President.
E. G. Weadock.....Vicepresident.
J. F. Mathews.....Secretary and Treasurer.

MEMBERS

Bachmayer, G. A., Lima.
Bates, F. L., Lima.
Bice, A. W., Lima.
Burton, E. G., Lima.
Collins, C. C., Lima.
Derbyshire, Justin, Lima.
Hiner, S. B., Lima.
Hover, W. E., Lima.
Huntley, J. H., Lima.
McCall, E. E., Lima.
Mathews, J. F., Lima.
Mumaugh, S. S., Lima.
Parent, W. H., Lima.
Roush, William, Spencerville.
Rudy, A. S., Lima.
Steiner, D. W., Lima.
Steiner, I. F., Lima.
Steuber, F. G., Lima.
Steuber, L. J., Lima.
Terwilliger, T. R., Lima.
Vail, J. B., Lima.
Van Note, W. B., Lima.
Weadock, E. G., Lima.
Weadock, T. M., Lima.

ASHTABULA, LAKE AND GEAUGA MEDICAL SOCIETY.

W. S. King.....President.
W. O. Ellsworth.....First Vicepresident.
Wm. Leet.....Second Vicepresident.
F. M. Houghtaling.....Secretary.
A. W. Hopkins.....Treasurer.

MEMBERS

Aldrich, D. B., Ashtabula.
Amidon, H. N., Painesville.
Anderson, G. S., Andover.
Arner, A. L., Jefferson.
Baker, C. D., Conneaut.
Battles, Mary, Ashtabula.
Baxter, R. J., Conneaut.
Blakeslee, O. O., Conneaut.

Block, J. M., Montville.
Bollard, G. D., Jefferson.
Burrows, S. S., Geneva.
Buys, Frank, Painesville.
Case, Clarence E., Ashtabula.
Case, F. D., Ashtabula.
Clark, F. R., Trumbull.
Crockett, Ernest, Ashtabula.
Cossit, D. S., Conneaut.
Dickson, J. A., Ashtabula.
Dickson, O. A., Jefferson.
Dorman, H. W., Ashtabula.
Edwards, P. J., Huntsburg.
Ellsworth, W. O., Austinburg.
Fisher, F. W., Ashtabula.
Flower, W. R., Ashtabula.
Fox, C. L., Kingsville.
Gilchrist, W. L., Ashtabula.
Graham, J. M., Williamsfield.
Grover, C. T., Orwell.
Hall, Theodore, Ashtabula.
Hogan, J. J., Ashtabula.
Hopkins, A. W., Ashtabula.
Houghtaling, F. M., Austinburg.
House, C. H., Painesville.
King, W. S., Ashtabula.
Leet, Wm., Conneaut.
Merriam, E. D., Conneaut.
Merriman, D. J., Painesville.
Osborn, H. M., Kelloggsville.
Palmer, D. G., Geneva.
Pomeroy, A. L., Windsor.
Pomeroy, O., Chardon.
Quayle, C. H., Madison.
Robinson, O. C., Windsor.
Shalto, H. J., Colebrook.
Snyder, F. D., Ashtabula.
Tibbits, F. E., Geneva.
Tower, B. M., Conneaut.
Upson, F. W., Conneaut.
Warner, A. D., Burton.
Webster, G. E., Kingsville.
Weiss, W. L., Rock Creek.
Whitsey, H. E., Ashtabula.
Wilson, H., Conneaut.

BELMONT COUNTY MEDICAL SOCIETY.

J. G. Wilson.....President.
A. W. Divan.....Vicepresident.
A. C. Beetham.....Treasurer.
J. S. McClellan.....Secretary.
Board of Censors—J. O. Howells, J. W. Cooper and J. C. Archer.

MEMBERS

Archer, John C. C., Neffs.
Beetham, A. C., Bellaire.
Berry, Jacob, Powhatan.
Blackford, J. M., Martins Ferry.
Boone, D. W., Bellaire.
Boone, J. S., Powhatan.
Calhoun, G. E., Maynard.
Clark, J. A., Bellaire.
Cooper, J. W., Bellaire.
Cope, E. C., Barton.
Diven, A. W., Martins Ferry.
Drennen, J. N., Loydsville.
Eddy, H. B., Bellaire.
Gregg, S. T., Barnesville.
Harris, W. P., Shady Side.
Heath, J. M., Bellaire.
Heinlein, A. J., Bridgeport.
Hewetson, A. H., St. Clairsville.
Hobson, A. B., Flushing.
Hobson, J. A., Flushing.
Howells, J. O., Bridgeport.
Judkins, W. L., Barnesville.
Keesor, O. M., Beallsville.
Kern, J. T. W., Bellaire.
Korell, F. A., Key.
Korner, A. H., Woodsfield.
Lane, F. W., Fairview.
McClellan, J. S., Bellaire.
McClester, J. C., Harrisville.
Marsh, V. N., Flushing.
Moffatt, John M., Glencoe.
Murphy, M. D., Bethesda.
Parry, J. R., Woodsfield.
Phillips, D. F., Morriston.

Piersol, Joseph, Bellaire.
Shepherd, D. O., Barnesville.
Thompson, W. E., St. Clairsville.
Webster, J. V., Flushing.
West, H. S., McMechen, W. Va.
West, J. P., Bellaire.
West, S. L., St. Clairsville.
Williams, B. O., Martins Ferry.
Wilson, J. G., Colerain.

BROWN COUNTY MEDICAL SOCIETY.

A. W. Mitchell.....President.
W. Love.....Vicepresident.
R. B. Hannah.....Secretary and Treasurer.

MEMBERS

Clemons, Jos., New Hope.
Evans, C. W., Russellville.
Fee, R. B., Georgetown.
Francis, A. W., Ripley.
Guthrie, H. S., Higginsport.
Hannah, R. B., Georgetown.
Leonard, L. H., Mt. Orab.
Love, Wesley, Higginsport.
Mitchell, A. W., Georgetown.
Prime, Robert, Ripley.
Sheldon, S. B., Five Mile.
Shelton, H. P., Georgetown.
Stephenson, Y., Georgetown.
Tyler, George P., Ripley.

BUTLER COUNTY MEDICAL SOCIETY.

J. A. Dickey.....President.
J. A. Grafft.....Secretary.
J. E. Torrence.....Treasurer.

MEMBERS

Abbott, E. H., Summerville.
Alexander, W. S., Oxford.
Barden, F. M., Hamilton.
Brown, Walter, Hamilton.
Bundy, D. B., Middletown.
Corson, O. M., Middletown.
Cherryholmes, W. K., Hamilton.
Cook, George, Hamilton.
Cook, George F., Oxford.
Cook, Harvey, Oxford.
Dickey, T. A., Middletown.
Enders, William, Hamilton.
Fitton, F. M., Hamilton.
Fitzpatrick, T. V., Cincinnati.
Francis, John, Hamilton.
French, E. H., Hamilton.
George, F. J., Okeana.
Grafft, G. James, Trenton.
Grafft, A. J., Hamilton.
Hancock, W. D., Millville.
Hermann, G. A., Hamilton.
Hinckley, H. D., Cincinnati.
Hornung, F. G., Hamilton.
Huston, Charles N., Hamilton.
Huston, William C., Hamilton.
Jacobs, M. M., Hamilton.
Lorimer, H. F., Jamestown.
Krouse, Henry, Hamilton.
Loomis, G. D., Middletown.
Macready, James, Monroe.
Mallory, Henry, Hamilton.
Millikin, Dan, Hamilton.
Millikin, Mark, Hamilton.
Owsley, J. B., Jacksonburg.
Reed, C. A. L., Cincinnati.
Reed, W. S., Stockton.
Roll, J. H., Hamilton.
Scheel, J. O., Hamilton.
Schaefer, C. A., Hamilton.
Schumacher, August, Hamilton.
Sharkey, B., Middletown.
Sill, E. C., Hamilton.
Skinner, G. C., Hamilton.
Smedley, A. L., Hamilton.
Torrence, J. E., Hamilton.
Twitchell, Herbert, Hamilton.
Wasson, C. C., Hamilton.

CHAMPAIGN COUNTY MEDICAL SOCIETY

S. M. Mosgrove.....President.
D. R. Emmons.....Vicepresident.
D. O'Brien .....Treasurer.
E. W. Ludlow.....Secretary.

MEMBERS

Baker, B. F., St. Paris.
Demand, C. E., Mechanicsburg.
Driscoll, Park, Crayon.
Emmons, D. R., North Lewisburg.
Henderson, R., Urbana.
Hunt, H. B., St. Paris.
Leonard, B. B., West Liberty.
Longfellow, J. V., Urbana.
Ludlow, E. W., Urbana.
McLaughlin, C. M., Westville.
Mosgrove, J. M., Urbana.
Mosgrove, S. M., Urbana
O'Brien, D., Urbana.
Pearce, H. C., Urbana.
Pearce, H. M., Urbana.
Pickering, G. W., Urbana.
Preston, H. S., Mutual.
Smith, M. L., Urbana.
Sullivan, D. L., Urbana.
Thompson, C. E., Urbana.

CLARK COUNTY MEDICAL SOCIETY.

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C. L. Minor.....First Vicepresident.
J. A. Link.....Second Vicepresident.
Wm. B. Patton.....Secretary and Treasurer.

MEMBERS

Baldwin, Henry, Springfield.
Bell, R. L., Springfield.
Bliss, C. B., Springfield.
Buckingham, J. M., Springfield.
Carroll, T. M., Springfield.
Collins, M. H., South Charleston.
Davis, Ben., New Carlisle.
Davis, E. B., North Hampton.
Davis, E. F., Springfield.
Davy, J. O., Springfield.
Dugan, J. P., Springfield.
Gotwald, D. K., Springfield.
Hebbel, Robert C., Enon.
Hiestand, H. L., Donnellsville.
Hulick, J. W., Springfield.
Hunt, W. S., Springfield.
Hutchings, S. R., Springfield.
Kay, Isaac, Springfield.
Kay, Clarence H., Springfield.
Link, J. A., Springfield.
McClintock, A., New Moorefield.
Minor, C. L., Springfield.
Moore, J. J., South Charleston.
Myers, J. E., Springfield.
Patton, M. V., Springfield.
Patton, Wm. B., Springfield.
Ramsey, Clarence, Springfield.
Reade, T. M., Springfield.
Riegel, T. L., Thackery.
Rind, Robert C., Springfield.
Rodgers, John H., Springfield.
Seys, H. H., Springfield.
Smith, W. A., Springfield.
Smith, E. H., Vienna Cross Roads.
Spence, W. D., Springfield.
Titlow, B. D., Springfield.
Vance, A. H., Springfield.

CLERMONT COUNTY MEDICAL SOCIETY.

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J. D. Abbott.....Vicepresident.
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MEMBERS

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Bennett, C. A., Withasville.
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Brown, H. M., Hillsboro.
Bryan, S. A., Cincinnati.
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Gatch, Conn, Milford.
Hines, G. L., Williamsburg.
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Hulick, J. W., Springfield.
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Kennedy, C. L., Laurel.
Kennedy, P., Laurel.
Leever, W. E., Owensville.
Love, J. H., Hamersville.
Love, Wesley, Higginsport.
Mann, J. W., Long View, Cincinnati.
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McClaim, J. B., Sardinia.
McKee, A. B., Felicity.
McKibben, J. T., Cincinnati.
McKibben, Wm., Cincinnati.
Mitchell, T. A., Owensville.
Moore, A. C., Amelia.
Morris, A., Goshen.
Mullin, T. J., New Richmond.
Redrow, Isaac, Williamsburg.
Rickets, Edwin, Cincinnati.
Scott, Thos., New Hope.
Scott, Wm., Loveland.
Snyder, Frank E., Owensville.
Strope, W. J., Hamersville.
Thompson, W. E., Bethel.
Tucker, W. E., Felicity.
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Williams, B. T., Goshen.
Witham, Samuel, Withamsville.

CLINTON COUNTY MEDICAL SOCIETY.

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E. Briggs.....Secretary.
N. B. Van Winkle.....Treasurer.

MEMBERS

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Craig, James, Salina.
Hale, W. R., Wilmington.
Lambright, Simeon, Lee's Creek.
Lightner, Frank, Sabina.
Lightner, S. B., Sabina.
Moon, S. B., Wilmington.
Quinn, A. T., Wilmington.
Quinn, T. C., New Vienna.
Savage, T. J., Bowersville.

Shreeves, Elizabeth, Wilmington.
Smith, S., Lumberton.
Snook, C. W., Clarksville.
Taylor, Frank A., Lee's Creek.
Telfair, G. M., Bloomington.
Tribett, C. A., Westboro.
Trimble, R. T., New Vienna.
Van Winkle, N. B., Blanchester.
Whistler, H., New Antioch.
Wire, G. W., Wilmington.
Ward, Chas., Clarksville.
Wright, Frank O., Port William.

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Wm. C. Davis.....Treasurer.

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Beery, Joseph E.
Blackburn, M. E.
Blake, F. W.
Bleile, A. M.
Bonnet, A. O.
Bradley, I. A.
Brown, J. E.
Burgoyne, J. A.
Carleton, E. E.
Carter, Clarence C.
Clarke, Charles F.
Clouse, George M.
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Coleman, N. R.
Collison, F. J.
Combs, R. V.
Cooper, A.
Cooperrider, Charles A.
Custer, H. J.
Courtright, T. E.
Darby, F. H.
Davenport, Albert B.
Davidson, N. P.
Davis, William C.
Dennis, C. D.
Deuschle, William D.
Dick, William L.
Dixon, M. T.
Dumm, S. C.
Dunham, J. D.
Dunham, J. M.
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Edmiston, William E.
Emerick, Edson J.
Evans, Earl W.
Evans, A. E.
Evans, T. A.
Farrar, H. D.
Fraker, H. C.
Frame, J. A.
Frankenberg, Otto.
Fullerton, E. B.
Giffin, S. O.
Gilliam, D. Todd.
Gilliam, Earl M.
Goodman, S. J.
Gordon, J. L.
Graham, J. C.
Griffin, A. E.
Hamilton, Charles S.
Hamilton, E. A.
Hamilton, William D.
Harding, G. T., Jr.
Harris, H. L.
Harrod, C. L.
Hatton, E. M.
Hendrixson, H.
Hendrixson, O. S.
Herbst, Edward.
Holmes, R. W.
Hoover, T. C.
Johnson, A. M.
Johnson, F. L.
Jones, H. S.
Jones, J. F.
Jones, J. S.
Kahn, Louis.
Kinsell, D. R., Jr.

Kinsman, D. N.
Krouse, K. C.
Lawrence, F. F.
Leach, A.
Linhart, C. P.
Lippitt, B. F.
Loving, Starling.
McCafferty, Frank.
McClure, James A.
McKitrid, L.
McCoy, C.
McComb, J. B.
Magruder, J. J.
Mayhugh, G. H.
Means, Charles S.
Moninger, James H.
Moore, Dickson L.
Moore, H. M. W.
Mosby, G. W.
Murphy, J. A.
Norris, K. A.
Nessley, G. B.
O'Key, C. T.
Palmer, B.
Park, J. A.
Persinger, Carey.
Platter, Herbert M.
Probst, Charles O.
Phillips, J. M.
Pritchard, Wm. H.
Rankin, T. W.
Ranchous, W. E. M.
Rauschkolb, John.
Rauschkolb, C. T.
Rogers, William K.
Ross, Clarence C.
Schueller, Erwin W.
Shepard, Chas. J.
Shriner, P. D.
Spohr, Carl L.
Stein, Geo. S.
Steinfeld, Alexander M.
Stillman, Frank L.
Stockton, George.
Stout, Jacob A.
Tarbell, Robert C.
Taylor, Clovis M.
Taylor, Sterling B.
Teachnor, Wells.
Timberman, Andrew.
Turner, Chas. E.
Turney, Chas. F.
Tyler, James A.
Upham, John H. J.
Van Fossen, Jesse A.
Wardlow, Yeatman.
Warner, Frank.
Waters, George M.
Whitaker, Hervey W.
Whitehead, Howard.
Whitmer, E. A.
Whitten, Wm. F.
Wilcox, Starling S.
Wilson, Edward J.
Wilson, Ida M.
Winders, Frank.
Wirth, R.
Wissinger, Thomas K.
Wolfe, Albertus C.
Woodruff, LaFayette.
Wren, Wm. G.
Youmans, Thomas G.

DARKE COUNTY MEDICAL SOCIETY.

Philip Dickes.....President.
Donovan Robeson.....Vicepresident.
T. Leroy Noret.....Secretary.
S. A. Hawes.....Treasurer.

MEMBERS

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Anderson, L. C., Greenville.
Baker, Charles, German.
Ballinger, J. B., Webster.
Corwin, M. M., Savona.
DeFord, J. M., Hagerman.
Detamore, J. E., Union City, Ind.
Dickes, Philip, Greenville.
Dorwin, L. H., Gettysburg.
Fitzgerald, W. T., Greenville.
Ford, R., Greenville.
Garbold, A. A., German.
Guntrum, W. E., Greenville.
Guttermuth, Wm. C., Versailles.
Hartzell, J. D., North Star.
Hawes, I. H., Arcanum.

Hawes, S. A., Arcanum.
Haworth, A. H., New Madison.
Hecker, E. A., New Madison.
Husted, E. G., Beamsville.
Husted, J. L., Woodington.
Kerlin, J. D., Greenville.
Landis, E. E., Ft. Jefferson.
Layer, W. A., Hill Grove.
Lemon, W. L., Greenville.
Lynch, William, Greenville.
Martz, G. J., Greenville.
Meek, A. W., Hollandsburg.
Monger, Emerson, Greenville.
North, T. Leroy, German.
Rike, Wm. H., Versailles.
Robeson, Donovan, Greenville.
Rush, A. W., Greenville.
Ryan, C. F., Versailles.
Sewell, S. G., Greenville.
Silver, H. R., Gordon.
Snorf, H. A., Ansonia.
Starr, J. O., Pittsburg.
Stephens, Charles I., Ansonia.
Tucker, U. H., Glenkarn.

DEFIANCE COUNTY MEDICAL SOCIETY.

C. E. Slocum.....President.
J. J. Reynolds.....Vicepresident.
Katherine Hoover.....Secretary.

MEMBERS

Aldrich, P. H., Defiance.
Belau, Nettie N., Defiance.
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Coy, M. C., Stryker.
Denman, J. K., The Bend.
Finch, R. W., Defiance.
Hoover, Katherine, Defiance.
Huffman, G. W., Defiance.
Kinmont, T. C., Hicksville.
Leever, J. L., Defiance.
Lindersmith, H. C., Sherwood.
Powell, W. S., Defiance.
Replogle, M. V., Evansport.
Reynolds, J. J., Defiance.
Slocum, C. E., Defiance.
Stevens, M. B., Defiance.
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DELAWARE COUNTY MEDICAL SOCIETY.

Auxiliary since 1898

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W. M. T. S. Simms.....Vicepresident.
J. B. Woodworth.....Secretary.
C. W. Chidester.....Treasurer.
W. H. Woodworth.....Librarian.

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Buck, A. H., Delaware.
Chidester, C. W., Delaware.
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Fay, D. C., Ostrander.
Fowler, W. S., Delaware.
Gage, F. L., Delaware.
Hedges, W. B., Delaware.
Hughes, D. E., Delaware.
James, J. K., Delaware.
McCann, J., Delaware.
McIntyre, Wm., Warrensburg.
Murray, F. M., Delaware.
Semans, E. M., Delaware.
Semans, W. M., Delaware.
Stickney, F. A., Kilbourne.
Talley, C. E., Powell.
Westbrook, A. E., Ashley.
Willey, A. J., Delaware.
Willey, P. W., Lewis Center.
Woodworth, J. B., Delaware.
Woodworth, W. H., Delaware.

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J. F. Whittaker, Bloomingdale.....Fourth Vicepresident.
J. C. M. Floyd, Steubenville.....General Secretary.
J. F. Purviance, Steubenville.....Recording Secretary.

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Andrews, R., East Liverpool.
Bailey, W. N., East Liverpool.
Barkhurst, S. O., Steubenville.
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Blazer, H. E., Salineville.
Bozman, H. E., New Alexandria.
Calhoun, W. M., East Liverpool.
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Clark, W. R., East Liverpool.
Cole, C. C., Bridgeport.
Collins, J. W., Toronto.
Cooper, J. W., Bellaire.
Diven, A. W., Martin's Ferry.
Elliott, Jas. T., East Liverpool.
England, W. L., Jewett.
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Fisher, B. H., Steubenville.
Floyd, J. C. M., Steubenville.
Foster, Ira C., Wintersville.
Geisey, E. R., Toronto.
Gregg, M. Smithfield.
Harrison, R., East Liverpool.
Hawthorne, E. S., Mt. Pleasant.
Heinlin, A. J., Bridgeport.
Hobbs, W. A., East Liverpool.
Hobson, J. A., Flushing.
Hoge, W. D., Portland Station.
Holland, A. B., Wellsville.
Howells, W. O., Bridgeport.
Ikert, George P., East Liverpool.
Kerns, J. T. W., Bellaire.
Laughlin, R., Steubenville.
Lemmon, L. A., Calcutta.
Lindsay, J. A., Salineville.
Marquis, Tom. B., Lisbon.
Marshall, R. J., East Liverpool.
Martin, J. W., Unionport.
McClellan, J. S., Bellaire.
McColough, J. A., Steubenville.
McCoy, J. J., Steubenville.
McFarland, W. S., Wellsville.
McGavran, S. B., Cadiz.
McGlenn, J. A., Mt. Pleasant.
Miller, J. E., Steubenville.
Minor, H. C., Toronto.
Morrison, Paul, Martin's Ferry.
Mowen, W. E., East Liverpool.
Nelson, H. W., Steubenville.
Oliver, J. F., Steubenville.
Ong, A. R., Martin's Ferry.
Park, B. R., Wellsville.
Pearce, E., Steubenville.
Podlewski, S. J., Steubenville.
Price, L., Toronto.
Purviance, J. F., Steubenville.
Rea, E. H., Irondale.
Saint, J. N., East Liverpool.
Snyder, D. J., Scio.
Spence, W. S., Germano.
Trimmer, E. L., East Liverpool.
Watt, J. M., Toronto.
West, J. P., Bellaire.
Whittaker, J. F., Bloomingdale.
Williams, B. O., Martin's Ferry.
Wood, W. H., Smithfieid.
Young, J. P., Empire.

ERIE COUNTY MEDICAL SOCIETY.

Auxiliary since 1877 Annual Meeting in April

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M. J. Love.....Vicepresident.
E. Stanley.....Vicepresident.
H. C. Schoepfle.....Secretary.

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Buckingham, E. V., Chicago Junction.
Busch, Wm. H., Sandusky.
Cook, A. F., Sandusky.
Davis, Carrie Chase.
De La Barre, Paul, Port Clinton.
Engleby, F. E., Vermillion.
Goodsell, E. J., Norwalk.
Graefe, Chas., Sandusky.
Graefe, Wm., Sandusky.
Haynes, J. T., Soldiers' Home.
Heiter, Karl, Sandusky.
Hessell, A. A., Put-in-Bay.
Hyde, A. G., Soldiers' Home.
Kreider, C. F., Monroeville.
Love, M. J., Bloomingville.
Merz, Chas. H., Sandusky.
Odenbaugh. J.
Osborn, A. L., Norwalk.
Peterson, H. D., Kelley's Island.
Quigley, R. L., Vermillion.
Rauz, W. E., Soldiers' Home.
Schoepfle, H. C., Sandusky.
Stanley, Ellwood, Sandusky.
Story, Wm, Castalia.
Sykes, R. D., Chicago Junction.
Waters, R. L., Lakeside.
Woessner, N. E., Huron.
Young, D. H., Wakeman.

GALLIA COUNTY MEDICAL SOCIETY.

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J. B. Alcorn.....Secretary.

MEMBERS

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Alcorn, J. B., Gallipolis.
Alcorn, J. G., Gallipolis.
Allen, H. S., Gallipolis.
Allison, T. J., Wales.
Bean, L. C., Gallipolis.
Cherrington, J. S., Pine Grove.
Clark, A. T., Vinton.
Cromley, F. A., Gallipolis.
Chadburn, T. L., Gallipolis.
Duston, J. B., Bidwell.
Ewing, G. K., Ewington.
Ely, C. W., Cheshire.
Ellsworth, E. E., Gallipolis.
Eakins, Jehu, Gallipolis.
Gerlach, H. P., Crown City.
Gill, Wm. C., Gallipolis.
Howell, W. E., Rio Grande.
Hanson, J. T., Gallipolis.
Jacobs, R. D., Vinton.
Jordan, S. S., Gallipolis.
Lupton, Ella G., Gallipolis.
Miller, William, Thurman.
Mills, O. S., Gallipolis.
Ohlmacher, A. P., Gallipolis.
O'Connell, Richard, Gallipolis.
Parker, E. W., Gallipolis.
Parker, C. G., Gallipolis.
Parker, C. B., Gallipolis.
Rife, C. A., Kyger.
Shaffer, D. R., Peniel.
Strausbaugh, J. C., Vinton.
Shaw, H. W., Gallipolis.
Stewart, R. Scott, Rio Grande.
Turner, L B., Bidwell
Williams, S. W., Mercerville.

GREENE COUNTY MEDICAL SOCIETY.

H. R. McClellan.....President.
H. F. Lorimer.....Vicepresident.
A. C. Messenger.....Secretary.
F. M. Kent.....Treasurer.

MEMBERS

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Brundage, A. H., Xenia.
Brundage, L. H., Xenia.
Dice, S. D., Xenia.
Finlay, W. H., Xenia.
Galloway, C. M., Xenia.

Grube, R. H., Grape Grove.
Harris, J. H., Yellow Springs.
Harris, J. M., Clifton.
Hendrixson, O. P., Yellow Sp'gs.
Humphrey, W. H., Yellow Sp'gs.
Jones, L. M., Jamestown.
Kent, F. M., Spring Valley.
Lackey, J. C., Jamestown.
Lindsay, F. T., Xenia.
Lorimer, Hugh F., Jamestown.
Marquart, O. M., Osborn.
Marsh, M. I., Cedarville.
McClellan, H. R., Xenia.
McClellan, A. C., Xenia.
Murrell, Grant, New Burlington.
Ogan, F. W., Jamestown.
Rouse, W. L., Paintersville.
Savage, Thomas, Bowensville.
Schrock, E. B., Yellow Springs.
Smith, R. W., Spring Valley.
Stewart, J. O., Cedarville.
Spahr, D. E., Clifton.
Treherne, J. M., Zimmerman.
Wilson, S. S., Xenia.
Wright, C. F., Port William.

HANCOCK COUNTY MEDICAL SOCIETY.

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N. L. McLachlan.....Vicepresident.
Don C. Hughes.....Secretary and Treasurer.

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Brayton, W. G., Fostoria.
Entrekin, F. B., Findlay.
Ewing, M. J., Findlay.
Firmin, F. W., Findlay.
Firmin, J. M., Findlay.
Herrington, S. G., Rawson.
Hersh, E. G., McComb.
Howell, J. A., McComb.
Hughes, Don C., Findlay.
Hurd, A., Findlay.
Kimmell, J. A., Findlay.
Martin, J. C., Findlay.
McLachlan, N. L., Findlay.
McLeod, J. R., Findlay.
Metzler, W. M., Vanlue.
Wilson, T. S., Findlay.
Yost, W. N., Findlay.

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M. S. Pixley.....Secretary.
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Berndt, A. D., Portsmouth.
Chabot, G. W., Otway.
Cotton, D. B., Portsmouth.
Edwards, F. M., Portsmouth.
Ellis, W. C., Portsmouth.
Fitch, Jas. W., Portsmouth.
Frizella, J. S., Buena Vista.
Fulton, Margaret C., Portsmouth.
Haldermann, S. S., Portsmouth.
Hall, Loren, Portsmouth.
Kline, P. J., Portsmouth.
Moore, A., Portsmouth.
Micklethwait, W. D., Portsmouth.
McCann, T. H., Scioto P. O., Scioto,
McCall, E. O., Portsmouth.
McKerrichan, S. B., Portsmouth.
Osborne, G. W., Portsmouth.
Pixley, M. S., Portsmouth.
Rardin, J. S., Portsmouth.
Ray, J. B. Jr., Portsmouth.
Sellards, A. G., Portsmouth.
Sellards, Howard C., Portsmouth.
Smith, W. W., Portsmouth.
Sulzur, Gustavus C., Portsmouth.
Taylor, James L., Wheelersburg.
Test, A. L., Portsmouth.
Warwick, J. B., Lucasville.
Warwick, C. M., Lucasville.
Williams, F. H., Portsmouth.
Williamson, Joseph, Sciotoville,

HIGHLAND COUNTY MEDICAL SOCIETY.

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T. W. Roberds, Bell.....Treasurer.
Lockhart Nelson, Hillsboro.....Secretary.

MEMBERS

Beam, A. H., Hillsboro.
Beeson, H. A., Leesburg.
Brown, H. M., Hillsboro.
Chaney, S. F., Pricetown.
Conard, G. R., New Vienna.
Cornetet, E. W., Piketon.
Dunlap, R. S., Greenfield.
Duvall, T. W., Lynchburg.
Gibson, Jas. T., Lynchburg.
Glasgow, J. A., Bell.
Glenn, W. W., Hillsboro.
Granger, B. D., Hillsboro.
Granger, F. M., Russells.
Holmes, B. F., Hillsboro.
Holmes, R. E., Leesburg.
Hook, O. C., Marshall.
Hopkins, O. A. Martinsville.
House, L. F., Sinking Springs.
Jones, Robt. J., Greenfield.
Judkin, E. S., Highland.
Lafferty, N. B., Hillsboro.
Larkin, J. C., Hillsboro.
Leatherman, J. W., New Market.
Love, E. W., Fayettsville.
Matthews, J. W., Buford.
McBride, D. N., Rainsboro.
McCann, F. B., Greenfield.
McGarraugh, T. S., Greenfield.
McNulty, J. H., East Monroe.
Nelson, Lockhart, Hillsboro.
Patterson, W. S., Hillsboro.
Quinn, Thos. C., New Vienna.
Roberds, T. W., Bell.
Russ, H. A., Hillsboro.
Scott, W. T., Martinsville.
Smith, C. B., Hillsboro.
Srofe, W. J., Lynchburg.
Thomas, F. M., Samantha.
Trimble, R. T., New Vienna.
Van Winkle, N. B., Blanchester.
Wilson, Frank L., Greenfield.
Wilson, W. H., Jr., Greenfield.

HOLMES COUNTY MEDICAL SOCIETY.

D. S. Olmstead.....Acting President.
D. S. Olmstead.....Secretary.

MEMBERS

Bingham, Jno. G., Millersburg.
Carson, F. D., Benton.
Crump, A. A. Jr., Millersburg.
Crump, A. A. Sr., Millersburg.
Cole, A. T., Millersburg.
Graff, William, Mt. Hope.
Heinig, Emil, Killbuck.
Hoyer, A. M., Nashville.
Jones, A. L., Glenmont.
Jones, H. S., Clark.
Jones, Jno. M., Glenmont.
Negelspach, Otto, Holmesville.
Olmstead, D. S., Millersburg.
Pomerene, Lister, Berlin.
Purdy, P. W. E., Killbuck.
Shalliol, Peter, Winesburg.
Stuckey, A. J., Walnut Creek.
Whitmar, J. E., Charms.
Wilson, T. R., Smithville.
Wise, S. P., Millersburg.
Wise, Ralph, Millersburg.

JACKSON COUNTY MEDICAL SOCIETY.

J. H. Ray.....President.
J. E. Sylvester.....Vicepresident.
J. F. Morgan.....Treasurer.
W. B. Warren.....Secretary.

MEMBERS

Barrett, S. P., Byer.
Dando, E. T., Wellston.
Darling, G. W., Wellston.
Davis, D. W., Berlin Cross Rds.
Drake, T. J., Leo.
Evans, W. R., Jackson.
Ewing, G. A., Jackson.
Gahm, J. L., Jackson.
Harbarger, G. H., Coalton.
Harper, J. A., Wellston.
Harbarger, J. W., Glen Roy.
Harrison, C. B., Wellston.
Hughes, E. E., Oak Hill.
Hunter, J. S., Jackson.
Jacobs, Philander, Jackson.
Jones, E. J., Oak Hill.
Kinnison, N. L., Limerick.
McClung, J. J., Jackson.
McLaughlin, Oscar, Rempel.
Morgan, J. F., Jackson.
Parker, W. H., Wellston.
Plummer, T. E., Coalton.
Ray, A. G., Byer.
Ray, E. S., Hamden Junction.
Ray, J. H., Coalton.
Ray, Worth, Coalton.
Shaffer, D. R., Peniel.
Sylvester, J. E., Wellston.
Warren, D. B., Wellston.
Williams, W. E., Jackson.
Woodrow, O. M., Wellston.

JEFFERSON COUNTY MEDICAL SOCIETY.

B. H. Fisher.....President.
A. A. Elliott.....Secretary.

MEMBERS

Blackburn, A. M., Steubenville.
Elliott, A. A., Steubenville.
Fisher, B. H., Steubenville.
Floyd, J. C. M., Steubenville.
Gregg, Melvin, Knoxville.
Nelson, H. H., Steubenville.
Pearce, E., Steubenville.
Whittaker, J. F., Bloomingdale.
Wood, W. H., Smithfield.

LORAIN COUNTY MEDICAL SOCIETY.

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Beyer, G. K., Lorain.
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Clerment, E. P., Grafton.
Cowley, R. H., Lorain.

Cox, S. S., Lorain.
Crawford, G. M., Lorain.
Cushing, Charles H., Elyria .
Dager, W. F., Lorain.
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Foster, W., North Amherst.
Garver, A. N., Lorain.
Garver, C. V., Lorain.
Gilbert, J., Lorain.
Gill, George, Ridgeville.
Gilmore, C. F., Lorain.
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Hubbell, W. B., Elyria.
Hugg, E. V., Lorain.
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Moffett, C. F., Lorain.
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Robinson, A. C., Lorain.
Thomas, J. B., Huntington.
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Wheatley, W. E., Lorain.
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MARION COUNTY MEDICAL SOCIETY.

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Baker, J. E., Caledonia.
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Crane, A. M., Marion.
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McMurray, Jas. W., Marion.
Martin, J. T., Marion.
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Rhu, H. S., Marion.
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Hartinger, D. B., Middleport.
Hartinger, D. S., Middleport.
Hoff, J. W., Pomeroy.
Holmes, A. F., Albany.
Hysell, J. H., Pomeroy.
Gribble, L. G., Pomeroy.
Miller, J. A., Pomeroy.
'edigo, S. E. G., Marshfield,
Petty, C. W., Hartford City. W. Va.
Poindexter, Charles, Cheshire.
Roush, L. F., Pomeroy.
Sayre, D. A., New Haven, W. Va.
Sisson, David, Middleport.
Stanley, A. A., Rutland.
Stobart, R. E., Pomeroy.
Swift, E. F., Longbottom.
Thomas, L. A., Middleport.

MIAMI VALLEY MEDICAL SOCIETY.

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Beebe, B. F., 320 E. Fourth St., Cincinnati.
Beeson, H. A., Leesburg.
Belt, R. C., Milford.
Bettman, H. W., 547 W. Seventh St., Cincinnati.
Bishop, N. W., Loveland.
Blair, B. H., Lebanon.
Bonar, J. I., 238 E. Fourth St., Cincinnati.
Bonifield, C. L., 432 W. Fourth St., Cincinnati.
Boylan, J. E., 319 Broadway, Cincinnati.
Bragg, W. N., 431 Pike St., Reading.
Briggs, E., Wilmington.
Brown, E. M., Amelia.
Brown, H. M., 22 W. Seventh St., Cincinnati.
Brown, Joseph E., 1324 Race St., Cincinnati.
Carothers, D. A., 415 Broadway, Cincinnati.
Carmichael, W. A., Loveland.
Cline, Galen L., Perintown.
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Cullen, G. I., 714 W. Sixth St., Cincinnati.
Curry, F. C., Milford.
Evans, W. P., Miamiville.
Fisher, Herschel, Lebanon.
Fitzpatrick, T. V., 32 W. Eighth St., Cincinnati.
French, E. H., Glendale.
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Gatch, Con. W., Milford.
Gillespie, Wm., 415 Broadway, Cincinnati.
Goode, Geo. H., 436 W. Seventh St., Cincinnati.
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Hall, Rufus B., 628 Elm St., Cincinnati.
Highlands, W. W., Newtown.
Hough, Chas. A., Lebanon.
Johnstone, A. W., Madisonville Road, Cincinnati.
Juettner, A. F., 1387 Ohio Ave., Cincinnati.
Juettner, Otto, 1409 Elm St., Cincinnati.
Knight, A. L., Madisonville.
Kreiger, G. L., Madisonville.
Lambright, S., South Lebanon.
Langdon, F. W., 13 E. Seventh St., Cincinnati.
Lever, F. H., Loveland.
Lieuellen, J. O., Mainville.
Lyman, D. S., Goshen.
Macready, J. A., Monroe.
Marsh, F. O., 1616 Main St., Cincinnati.
Mitchell, T. A., Owensville.
Mitchell, E. W., 3303 Reading Road, Cincinnati.
Moore, J. W., Middletown.
Morris, A., Goshen.
Moss, W. F., Mainville.
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Mounts, Leonard, Morrow.
Mullen, T. J., New Richmond.
Murphy, A. D., 109 W. Eighth St., Cincinnati.

Oliver, J. C., 628 Elm St., Cincinnati.
Orr, Geo. B., 423 E. Fourth St., Cincinnati.
Prugh, George W., 2101 Eastern Ave., Cincinnati.
Quinn, T. C., New Vienna.
Reamy, Thad. A., Oak St., Cincinnati.
Reed, Chas. A. L., St. Leger Pl., Cincinnati.
Ricketts, B. Merrill, 415 Broadway, Cincinnati.
Ricketts, Edwin S., 415 Broadway, Cincinnati.
Roberts, A. C., Morrow.
Romine, Maria M., Harveysburg.
Sandoe, J. L., Pearl and Butler Sts., Cincinnati.
Scott, J. B., 1624 Western Ave., Cincinnati.
Scott, N. I., Norwood.
Scott, Wm., Loveland.
Scott, W. T., Martinsville.
Shields, E., 2008 Forum Road, Cincinnati.
Snider, Frank, Midland.
Snook, C. W., Clarksville.
Spence, A. D., Goshen.
Spence, C. J., 1036 Celestial St., Cincinnati.
Stevens, A. S., Kings Mills.
Stevens, E. S., Lebanon.
Strickler, Louis, 18 E. Eighth St., Cincinnati.
Taylor, Wm. H., 533 W. Seventh St., Cincinnati.
Thompson, J. A., 628 Elm St., Cincinnati.
Tribbet, C. A., Westboro.
Trimble, R. T., New Vienna.
Tufts, Chas. W., Hartwell.
Van Winkle, B. L., Blanchester.
Van Winkle, N. B., Blanchester.
Wakefield, J. D., Loveland.
Walker, E. W., 30 W. Eighth St., Cincinnati.
Walton, L. A., Milford.
Wire, G. W., Wilmington.
Weaver, Walter B., 32 W. Eighth St., Cincinnati.
Whitacre, H. J., Auburn Ave., Cincinnati.
Zenner, Philip, Glen Bldg., Cincinnati.
Zinke, E. Gustav, 13 Garfield Pl., Cincinnati.

MONTGOMERY COUNTY MEDICAL SOCIETY.

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Wilfred Taylor.....Secretary.
C. S. Judy.....Vicepresident.
D. C. Lichliter.....Treasurer.
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Barker, F. D.
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Bonner, Horace.
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Breidenbach, C. H.
Burns, W. A.
Boone, A., Englewood.
Carter, E. L., West Carrolton.
Conklin, W. J.
Conklin, D. B.
Crum, E. C.
Dale, G. P.
Davisson, E. C.
Davisson, J. A.
Delscamp, W. H.
Dolina, J. F.
Duckwall, F. A.
Dunham, A. H.
Dupuy, T. V.
Evans, G. B.
Ewing, W. A.
Farber, J. H.
Fife, F.

Gaugler, R. S.
Gilbert, T. D.
Goodhue, George.
Gray, F. C.
Greene, D. W.
Gunckel, P. L.
Hale, P. D.
Haning, H. C.
Hatcher, H. H.
Hecker, L.
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Hochwalt, G. A.
Hooven, W. E.
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Humphreys, C. H.
Huston, E. M.
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Iddings, A. H.
Jewett, H. S.
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Kimmel, H. S.
King, C. W.
Kline, W. L.
Keever, B. W. D.. Centerville.
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MacGregor, Chas.
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Marshall, W. C.
Marshall, T. E.
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Ratliff, J. M.
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Reilly, D. G.
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Scheibenzuber, D.
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Smith, W. S.
Spitler, E. W., Center.
Slagle, C. D., Centerville.
Souders, S., Dean.
Shepherd, A. F.
Taylor, Wilfred.
Weaver, J. M.
Weaver, F. C.
Williamson, A. M.
Weaver, W. P., Miamisburg.

MORROW COUNTY MEDICAL SOCIETY.

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Morehouse, G. W., Sparta.
Neal, C. H., Cardington.
Pierce, R. L., Mt. Gilead.
Sherman, E. C., Columbus.
Spear, R. C., Mt. Gilead.
Thompson, F. E., Marengo.
Virtue, D. B., Iberia.
Warmeling, C. T., Cardington.
Welch, Ella, Ashley.
Williams, J. W., Chesterville.
Wood, J. W., Mt. Gilead.

MUSKINGUM COUNTY MEDICAL SOCIETY.

Auxiliary since 1894

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C. A. Dunn.....Vicepresident.
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W. C. Bateman.....Cor. Secretary.
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Geyer, H. R., Zanesville.
Geyer, J. L., Norwich.
Hanna, C. U., Zanesville.
Harris, H. B., Zanesville.
Higgins, Chas., Sonora.
Hill, Anna M., Zanesville.
Holden, J. L., Zanesville.
Holston, J. G. F., Zanesville.
Hosick, W. R., Adamsville.
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King, F. I., Hoople, N. Dakota.
Klemm, Wm., Zanesville.
Lane, G. W., Sago.
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Logsdon, E. C., Zanesville.
Mathews, D. J., Zanesville.
McCormick, G. W., Zanesville.
McCreary, H. M., New Concord.
Melick, John, Frazersburg.
Melick, W. A., Zanesville.
Mercer, N. D., Philo.
Nye, H. S., Zanesville.
Peabody, Anna, Zanesville.
Prout, G. B., Philo.
Rambo, C. M., Zanesville.
Sealover, Wm., Zanesville.
Sellers, C. P., Zanesville.
Sheppard, H. J., Zanesville.
Squires, A. W., White Cottage.
Sutton, H. T., Zanesville.
Templeton, A. M., Zanesville
Trout, C. B., Duncan's Falls.
Warburton, G., Zanesville.
Watkins, Fred., Fultonham.
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W. B. Van Note.....Second Vicepresident.
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Archer, John R., N. Baltimore.
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Ashton, Edwin, Lima.
Ayers, M. M., Continental.

Babcock, Harry L., Defiance.
Bailey, Gerard, Willshire.
Bain, Frank D., Kenton.
Bainbridge, Cathrine M., Toledo.
Baker, Joseph P., Findlay.
Baldwin, Flavius J., Findlay.
Banning, J. C., Belle Center.
Barlow, Edwin B., Toledo.
Barringer, David, Rocky Ridge.
Bates, Fred. L., Lima.
Baxter, Samuel A., Lima.
Beard, Loren A., Pioneer.
Beardsley, Chas., E. Ottawa.
Beardsley, Corydon O., Ottawa.
Beauchamp, Wesley W., Rockford.
Becker, Bernhardt, Toledo.
Begg, William H., Columbus Grove.
Beleau, Nellie, Defiance.
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Belt, William A., Kenton.
Benner, Charles T., Tiffin.
Berlin, Cicero, Wapakoneta.
Bessey, J. Mortimore, Toledo.
Betts, Chas., Toledo.
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Bishop, Sylvester P., Delta.
Blaine, Harry G., Attica.
Blair, Thomas, Lyons.
Bland, Jerome, Bucyrus.
Bloomfield, John, Napoleon.
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Bowen, A. Delbert, West Lodi.
Bowers, Isaiah S., Perrysburg.
Bowman, Madison H., Toledo.
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Brattain, G. M., Antwerp.
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Brayton, Wm. G., Fostoria.
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Burley, Samuel V., Bays.
Burritt, Charles A., Toledo.
Burritt, William H., Toledo.
Burton, Enos G., Lima.
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Campbell, Clair S., Tedrow.
Campbell, Lawrence W., Ada.
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Cessua, B. F., Kenton.
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Clark, J. Fred., Toledo.
Clark, J. R., Bluffton.
Clark, Lucien D., Toledo.
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Cole, C. B., Grand Rapids.
Cole, C. S., Toledo.
Cole, J. S., Toledo.
Cole, W. C., VanWert.
Coleman, James A., Toledo.
Collamore, George A., Toledo.
Collins, Charles, Lima
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Cook, J. M., Weston.
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Cosgrove, Thomas, Toledo.
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Coy, Martin C., Stryker.
Cramer, Martin S., Ohio City.
Craver, S. Belle, Toledo.
Crooks, Robert L., Convoy.
Curry, John H., Toledo.
Darbyshire, Morris H., McComb.
Davis, John, Gomer.
Davis, Samuel, Waterville.
Day, H. M., Pandora.
Deemer, Horace E., Antwerp.
Denman, James K., The Bend.
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Dickey, William A., Toledo.
Dine, Colston L., Minster.
Dix, Mrs. Sarah E., Paulding.
Donnelly, James, Toledo.
Duncan, Arthur M., Bucyrus.
Duncan, James A., Toledo.
Dunnigan, Fred. B., Maumee.
Durbin, Richard M., Woodville.
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Entrikin, Franklin B., Findlay.
Evans, J. B., Ada.
Ewing, Myron J., Findlay.
Ewing, Frank, West Cairo.
Faber, Charles A., Toledo.
Fast, Lee Roy, Paulding.
Fauster, John U., Paulding.
Files, Charles A., Van Wert.
Finch, Risdon W., Defiance.
Firmin, Francis W., Findlay.
Firmin, John M., Findlay.
Fiser, James H., Malinta.
Fisher, Albert W., Toledo.
Fisher, Charles E., Toledo.
Fisher, William H., Toledo.
Fledderjohann, H. E., New Knoxville.
Focht, William H., Tiffin.
Foltz, Tobias H., Lima.
Foltz, J. H., Kirby.
Force, Clarence A., Attica.
Galer, Frank M., DeGraff.
Gardiner, William G., Toledo.
Gardner, John, Toledo.
Gehrett, Theodore M., Deshler.
George, Edward, Van Buren.
George, John F., Fort Jennings.
Gibbon, Harmon B., Tiffin.
Gillette, William J., Toledo.
Glenn, Ludwell G., Kenton.
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Graefe, Charles, Sandusky.
Graham, Isaac E., Marseilles.
Green, Charles S., Fostoria.
Greenfield, Edgar J., Toledo.
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Groschner, Carl B., Toledo.
Guise, John M., Findlay.
Guise, Perry O., Findlay.
Gundrum, Willis H., Toledo.
Haag, Daniel E., Liberty Center.
Haag, Harry P., Liberty Center.
Hahn, Henry F., Toledo.
Haines, John B., Beaver Dam.
Haley, J. S., Napoleon.
Hall, Harry L., Toledo.
Halleck, Frank Dana, Portage.
Hamlin, George E., Toledo.
Hane, Charles Lincoln, Florida.
Harper, William H., Lima.
Harrison, Eugene B., Napoleon.
Harrison, Frank M., Napoleon.
Hartman, George W., Wauseon.
Hasencamp, Oscar, Toledo.
Hathaway, Harrison, Toledo.
Hattery, J. E., Celina.
Havighorst, Henry S., Toledo.
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Heaton, Charles A., McCutchinsville.
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Heffron, Charles H., Metamora.
Heileman, Jacob H., Waynesfield.
Heistand, E. B., Kenton.
Heller, Frederick S., Oak Harbor.
Heller, J., Grand Rapids.
Heltmann, Elmer W., Toledo.
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Henderson, George H., W. Cairo.
Henry, Albert G., N. Baltimore.
Herrington, Samuel G., Rawson.
Henzler, Charles J., Toledo.
Hersch, Edward G., McComb.
Hershiser, Henry K., Tiffin.
Hickey, William H., Leipsic.
Higbie, John L., Jenera.
Hill, Emily, Bowling Green.
Hill, Robert M. C., Delphos.
Hill, William W., Weston.
Hiner, Solomon B., Lima.
Hines, J. Arthur, Van Wert.
Hitchcock, Salathiel A., Elida.
Hixon, W. M., Delphos.
Hoege, George L., Fostoria
Holst, E. Bertram, Haskins.
Hover, William E., Lima.
Howell, J. Albert, McComb.
Hubbard, Thomas, Toledo.
Hughes, Don C., Findlay.
Huntley, Joseph H., Lima.
Hurd, Anson, Findlay.
Hutchinson, James H. S., Mifflin.
Huyck, Emory B., Oak Harbor.
Imhoff, C. E., Belmore.
Jacobi, Frank, Toledo.
Jacobson, Julius H., Toledo.
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Jenner, Albert B., Arlington.

Jones, C. P., Nevada.
Jones, Richard E., Gomer.
Jones, William H., Van Wert.
Kahle, A. Wesley, Lima.
Kahle, Raymond D., Lima.
Keller, Thomas F., Toledo.
Kennedy, Nelia B., Findlay.
Kimbell, Orville W., Tiffin.
Kimmell, Jacob A., Findlay.
Kimmont, Thomas C., Hicksville.
Kirkby, Cyrus A., Toledo.
Kishler, W. G., St. Mary's.
Kitchen, Francis A., Toledo.
Krebs, R. J., Waynesfield.
Ladd, Leonard E., Middlepoint.
Landmann, Otto, Toledo.
La Salle, James J., Toledo.
Lathrop, Arthur B., Swanton.
Landick, Lewis F., Lima.
Lawless, James T., Toledo.
Lever, John C., Eaton.
Lemley, Ernest P., Columbus Grove.
Lenhart, Peter J., Wauseon.
Leonard, B. B., West Liberty.
Leonard, Ben. S., West Liberty.
Lewis, Harry A., Continental.
Light, Frank, Ottawa.
Lisle, Lida, Celina.
Lisle, John M., Celina.
Lockhard, Lorenzo B., Toledo.
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Longsworth, Wm. N., Convoy.
Lony, Charles, Toledo.
Love, George Rusk, Toledo.
Lynch, William, Greenville.
McCall, Edwin E., Lima.
McClaren, Howard H., Bloomdale.
McClung, John C., Leipsic.
McConnell, David W., Marseilles.
McCormick, Edgar, Kossuth.
McCoy, Clem. D., Kenton.
McGavren, Geo. W., Van Wert.
McGuire, Charles W., Toledo.
McIlvain, Wm. H., Kenton.
McKellar, Arch., Green Springs.
McKinley, Daniel B., Dupont.
McKinley, E. Burns, Vaughnsville.
McKnight, Virginia Harley, Lima.
McLachlan, Norman L., Findlay.
McLaughlin, Chalmers C., Dunkirk.
McLeod, Joseph R., Findlay.
McOscar, J. R., Waterville.
McVety, Albert F., Toledo.
Maerker, A. E. H., Napoleon.
Manville, Andrew J., Bowling Green.
Martin, Franz S., Napoleon.
Martin, John C., Findlay.
Mather, T. J., St. Mary's.
Mathers, W. L., Bowling Green.
Mathews, J. F., Lima.
Matthias, Albert C., McComb.
Mauk, Edwin B., Delphos.
May, Edward G., Toledo.
Merz., Charles H., Sandusky.
Miller, Clarren S., Toledo.
Miller, George W., Lorain.
Miller, Stanton E., Florida.
Mills, Charles H., Toledo.
Montgomery, John S., Huntsville.
Moots, C. W., Delphos.
Morgan, Richard J., Van Wert.
Morris, Frank, Columbus Grove.
Morris, Joseph, Columbus Grove.
Mortland, David G., Edgerton.
Moury, David, Bellefontaine.
Mumaugh, Shelby, Lima.
Munn, Howard E., Toledo.
Munson, Augustus W., Kenton.
Murbach, Andrew J., Archbold.
Murbach, Edwin A., Archbold.
Myers, A. H., Carey.
Neuman, J. E., Leipsic.
Neville, W. S., Roundhead.
Nevins, J. I., St. Johns.
Newcomb, John I., West Unity.
Newton, C. William, Toledo.
Noble, Herbert E., Toledo.
Noble, Nathan T., St. Mary's.
Norris, Milton M., Fostoria.
Norris, Ora L., Deshler.
North, John, Toledo.
Nuding, William H., Botkins.
O'Dell, Samuel, Swanton.
Parent, William H., Lima.
Parker, Hal. M., Delta.
Paul, Alva L., Ottawa.
Pence, Leroy, Spencerville.
Perkins, Charles E., Norwalk.
Phelps, Charles H., St. Mary's.
Phillips, David P., Kenton.
Phillips, William S., Belle Center.
Pontius, Charles R., Fremont.
Pope, Joseph E., Dunbridge.

Powell, William S., Defiance.
Protzman, Elmer S., Kenton.
Pugh, Frank H., Bryan.
Radebaugh, Peter, New Bremen.
Ramsbottom, I. J., Wabash.
Reed, Elias J., Leipsic.
Reid, Charles B., Van Wert.
Reid, Calvin H., Toledo.
Reid, Warren F., Ottawa.
Reiff, Charles F., Fremont.
Reinfrank, John H., Perrysburg.
Reinfrank, Wm. H., Perrysburg.
Reinhart, James C., Toledo.
Reynolds, John J., Defiance.
Rhu, Auguste, Marion.
Rice, Robert H., Fremont.
Richardson, David H., Celina.
Richardson, E. O., Marion.
Richardson, J. V., Ft. Recovery.
Riley, Robert E., Celina.
Roether, Henry R., Perrysburg.
Rogers, George F., Bryan.
Rogers, Joseph A., Kenton.
Rohrs, Henry F., Napoleon.
Roller, Walter C., Spencerville.
Root, Henry A., Toledo.
Roush, William, Spencerville.
Rudy, Albert S., Lima.
Rudy, James F., Bluffton.
Sager, Joseph, Celina.
Sager, Newton, Jr., Herring.
Schaffer, J. Homer, Cridersville.
Schlink, Francis H., New Reigel.
Schnetzler, H. Marcus, Toledo.
Schnetzler, Jacob, Toledo.
Scott, I. K., La Rue.
Shaffner, J. T., Willshire.
Sharpe, William J., Toledo.
Shibley, Albert F., Glandorf.
Shepherd, Arthur F., Toledo.
Sherrard, A. C., Oakwood.
Sherwood, Horace W., Belmore.
Showman, Charles M., N. Baltimore.
Skinner, Samuel W., Toledo.
Slager, Jacob L., Paulding.
Slocum, Charles E., Defiance.
Smalley, William M., Ohio City.
Smith, Anna G., Toledo.
Smith, Charles H., Kenton.
Smith, Charles N., Toledo.
Smith, DeWitt C., Dunkirk.
Smith, William, Van Wert.
Snodgrass, Jesse, Kenton.
Snodgrass, William C., Kenton.
Snyder, Clarence, Rudolph.
Snyder, Earl A., Bryan.
Snyder, Walter Hamilton, Toledo.
Stamm, Martin, Fremont.
Stansell, Joseph A., Forest.
Steiner, David W., Lima.
Steiner, Isaac F., Lima.
Steiner, Henry G., Delphos.
Stephenson, Arlington, Ft. Recovery.
Stevens, Merari B., Defiance.
Stewart, Clarence E., Toledo.
Stewart, James M., Fremont.
Stewart, William D., Toledo.
St. John, Charles S., Bowling Green.
Storz, Christian, Toledo.
Stuckey, Walter, Wapakoneta.
Stueber, Fred S., Lima.
Stueber, Louis J., Lima.
Suker, George, Toledo.
Swimley, W. A., Forest.
Symons, John P., Rockford.
Taylor, Martin, Ft. Recovery.
Terwilliger, Thompson R., Lima.
Thacker, Ludwell G., Defiance.
Thomas, Bert E., St. Mary's.
Thomas, Orange H., Fremont.
Thompson, John C., Rollersville.
Thorn, Samuel S., Toledo.
Tobey, Henry A., Toledo.
Tracy, James L., Toledo.
Trichler, W. S., Bowling Green.
Trovinger, John R., Arlington.
Tubbs, Arba B., Ridgeville Corners.
Tuller, Willis M., Bowling Green.
Tupper, E. L., Ottawa.
Tuttle, Schuyler S., Van Wert.
Uberroth, Marion W., New Reigel.
Vail, Jonathan Byal, Lima.
Van Note, William B., Lima.
Van Pelt, Charles L., Toledo.
Vickers, Hilton A., Findlay.
Virtue, Frank M., Sulphur Springs.
Waddick, James M., Toledo.
Wagar, Charles P., Toledo.
Walker, R. G., Toledo.
Walters, J. W., Ada.
Waters, Ralph T., Lakeside.

Weadock, Thomas M., Lima.
Weaver, Phillip F., Coldwater.
Weger, George W., Delphos.
West, M. O., Mexico.
West, Thomas J., Tiffin.
Westrick, John D., Defiance.
Wetherill, Ira R., Bluffton.
Wilkins, Arch. W., Delta.
Wilkins, John A., Delta.
Wilkinson, E. L., Van Wert.
Willard, G. P., Tiffin.
Willett, Peter, Elmore.
Willett, Roland A., Elmore.
Williams, Freeman S., Kalida.
Williams, Linnaeus G., Fostoria.
Williamson, Milton S., Alvada.
Wilson, Theron S., Findlay.
Wintermute, G. J. C., Celina.
Wirebaugh, I. V., Prairie Depot.
Wood, William I., Medina.
Woods, John K., Van Wert.
Woods, Leroy S., Rawson.
Woods, Thomas E., Findlay.
Wordsworth, Miner, Hoytsville.
Wright, James B., Convoy.
Wright, John A., Toledo.
Yingling, George S., Tiffin.
Yost, William N., Findlay.
Young, Downing H., Chicago, O.
Young, Nelson H., Toledo.
Zebold, A. M., Shelby.
Zigler, H. H., Ayresville.
Zopfi, William J., Findlay.

PERRY COUNTY MEDICAL SOCIETY.

Auxiliary since 1897

N. T. McTeague.....President.
I. A. Moody.....Vicepresident.
J. G. McDougal.....Secretary and Treasurer.

MEMBERS.

Axline, J. D., Shawnee.
Axline, C. Z., Fultonham.
Axline, F. A., Saltillo.
Barnes, B. F., Newark.
Barrow, C. A., New Straitsville.
Book, R. D., Corning.
Brush, E. C., Zanesville.
Climsan, G. W., Thornville.
Clause, L., Somerset.
Clause, M., Somerset.
Cozad, H. S., Rendville.
Crofts, J. W., Corning.
Davis, J. I., Shawnee.
Dennison, J. M., Blatchford.
Donaldson, J. H., Gore.
Dupler, W. P., Crooksville.
Essington, U. K., Somerset.
Folk, P., Deavertown.
Gordon, P. A., Junction City.
Holcomb, C. B., Corning.
Kennedy, G. L., Roseville.
Lerch, A. V., Pleasantville.
McDougal, J. G., New Lexington.
McTeague, N. T., New Lexington.
Miller, J. F., Congo.
Miller, R. W., Hemlock.
Moody, I. A., Junction City.
Norman, O. M., Roseville.
O'Farrell, M., Shawnee.
Pugh, G. H., Thornville.
Richards, A., New Lexington.
Schenck, C. E., Thornville.
Sessams, J. S., Rendville.
Stoneburner, W. H., Roseville.
Thomas, B. A., Rushville.
Traut, G. B., Duncan Falls.
Walker, G. W. W., Roseville.
White, D. A., Thornville.
Winters, B. E., New Straitsville.
Wright, J. H., New Lexington.

ROSS COUNTY MEDICAL SOCIETY.

B. F. Miesse.....President.
F. M. Smallwood.....Secretary.

MEMBERS.

Cole, A. P., Chillicothe.
Cox., J. M., South Salem.
Deuschle, W. D., Columbus.
Evans, J. M., Clarksburg.
Evans, T. W., Richmond Dale.
Galbreath, E. J., Chillicothe.
Gorslene, G. L., Chillicothe.
Hall, R. B., Cincinnati.
Hall, W. A., Chillicothe.
Hanley, J. M., Chillicothe.
Lash, J. W., Chillicothe.
Leslie, J. M., Chillicothe.
Lightner, S. C., Hallsville.
Matthews, J. M., Clarksburg.
McKee, R. H., Bainbridge.
Meggenhoffen, E., Chillicothe.
Miesse, B. F., Chillicothe.
Miesse, Chas., Chillicothe.
Moore, W. E., Chillicothe.
Morgan, J. B. F., Clarksburg.
Pancake, Isaac, Jr., Frankfort.
Pricer, W. B., Ironton.
Ray, L. D., Gillespieville.
Reedy, C., Kingston.
Robb, H. H., Frankfort.
Robbins, G. E., Chillicothe.
Robinson, R. D., Hallsville.
Schmausser, C. E., Chillicothe.
Scott, D. H., Chillicothe.
Scott, W. S., Chillicothe.
Smallwood, E. H., Chillicothe.
Smallwood, F. M., Chillicothe.
Smith, W. A., Chillicothe.
Tatman, O. P., Chillicothe.
Van Winkle, J. A., Bourneville.
Wiltshire, J. M., Gillespieville.
Wiltshire, J. S., Gillespieville.

SHELBY COUNTY MEDICAL SOCIETY.

J. W. Costolo.....President.
G. E. Martin.....Vicepresident.
J. M. Costelo.....Secretary.
J. R. Caywood.....Treasurer.

MEMBERS.

Cable, T. B., Pemberton.
Carter, J. M., Jackson Center.
Caywood, J. R., Lockington.
Costelo, J. W., Sidney.
Dine, C. L., Minster.
Geyer, J. D., Sidney.
Hollopeter, J. S., Houston.
Hussey, M. F., Sidney.
Harbour, C. W. B., Anna.
Johnston, C. E., Sidney.
Loffer, O. W., Maplewood.
Martin, G. E., Anna.
Miller, J. F., Port Jefferson.
Milholland, Wm., Sidney.
McBurney, Ed., Jackson Center.
Peebles, G. E., Hardin.
Pepper, Lester C., Loramie.
Silver, D. R., Sidney.
Sharp, B. M., Sidney.
Smoot, C. E., Pemberton.
Staley, Ralph, Sidney.
Steeley, Ed., Anna.
Speece, N. V., Quincy.
Tate, G. M., Botkins.
Tate, C. H., Botkins.
Yates, E. A., Kirkwood.

SPRINGFIELD ACADEMY OF MEDICINE.

T. F. Bliss.....President.
Noah Myers .....First Vicepresident.
S. R. Hutchings.....Second Vicepresident.
C. L. Minor.....Secretary and Treasurer.

Executive Committee—G. F. Brubaker, C. S. Ramsey, W. B. Patton.

MEMBERS

Bell, R. L., 60 Spring st.
Bliss, T. F., cor. High & Spring.
Bliss, C. B., cor. High & Spring.
Bright, W. E., North Hampton.
Brinkman, G. D., 29⅛ S. Limestone st.
Brinkman, G. D., 29½ S. Limestone st.
Brubaker, G. F., 65 E. High st.
Davis, E. F., cor. High & Spring.
Davy, J. O., 20 W. High st.
Easton, J. C., 9½ E. Main.
Evans, O. H., 1 Clifton st.
Evans, C. W., 196 Clifton st.
Harris, E. C., 67 E. High st.
Harris, J. H., Clifton.
Hiestand, C. M., 65 E. High st.
Hiestand, H. L., Donaldsville.
Hutchings, S. R., 258 W. High st.
Link, J. A., cor. High & Spring.
Minor, C. L., Savings Bank Bldg.
Myers, Noah, 53 E. High st.
Myers, J. E., 53 E. High st.
Niles, L. E., 23½ S. Fount ave.
Patton W. B., Zimmerman Bldg.
Patton, M. V., 63 E. High st.
Ramsey, C. S., King Block.
Reade, T. M., 62½ E. Main st.
Spence, D. W., King Block.
Stafford, S. R., New Carlisle.
Syman, L. L., 23½ S. Fount ave.

STARK COUNTY ACADEMY OF MEDICINE.

R. J. Pumphrey.....President.
Esther M. Tyrrell.....Secretary and Treasurer.
Frank E. Hart.....Corresponding Secretary.

MEMBERS

Baker, W. O., Louisville.
Barnes, S. S. P., Massillon.
Banker, David F., Canton.
Becher, W. H., N. Industry.
Biechle, R. A., Canton.
Burns, Katherine, Canton.
Colver, Caroline, Massillon.
Conklin, S. A., Canton.
Corl, H. E., Middlebranch.
Crane, C. A., Canton.
Culbertson, N. W., Massillon.
DeWitt, J. P., Canton.
Exline, C. E., Canton.
Eyman, H. C., Massillon.
Flickinger, L. E., Canton.
Folk, E. S., Canton.
Foulkes, M. C., Canton.
Foulkes, W. S., Canton.
Fraunfelter, James, Canton.
Gans, D. W., Massillon.
Gavin, F., Canton.
Goodrich, C. H., Sandyville.
Hanson, H. P., Greentown.
Hart, F. E., Canton.
Hinden, F., Canton.
Hudson, J. F., Canton.
Kahler, J. Frank, Canton.
Klingensmith, J. B., Sparta.
Lichty, M. J., Cleveland.
Manchester, W. C., Sebring.
March, E. J., Canton.
March, H. A., Canton.

Marchand, J. F., Canton.
Miller, T. Clarke, Massillon.
Morrow, E. P., Canton.
Morrow, E. O., Canton.
Myers, E. G., Canton.
Pennock, Frank, Marlboro.
Pfouts. I. M., Massillon.
Portman, E. O., Canton.
Post, S. B., Canton.
Pumphrey, R. J., Massillon.
Reed, T. F., Massillon.
Reed, T. J., Massillon.
Reed, J. L., Canton.
Rheil, J. A., Malvern.
Ricksecker, O. C., Wilmot.
Robinson, S., Canton.
Schiltze, Clarence A., Canton.
Schilling, C. E., Canton.
Santee, L. B., Marlboro.
Smith, Maurice, Massillon.
Snively, John H., W. Lebanon.
Steele, W. C., New Berlin.
Talmadge, Eugene, Canton.
Tyrrell, Esther M., Canton.
Walker, A. B., Canton.
Walker, C. A., Louisville.
White, R. W., Mineral City.
Williams, E. G., New Berlin.
Wolff, C. P., Massillon.
Zinninger, George F., Canton.

TOLEDO MEDICAL ASSOCIATION.

Wm. H. Fisher.....President.
John North.....Vicepresident.
Chas. P. Wagar.....Recording Secretary.
A. C. Schnetzler.....Corresponding Secretary.
F. E. Klauser.....Treasurer.

MEMBERS

Alter, Francis W.
Anderson, W. W.
Bainbridge, Kathryn M.
Barlow, E. B.
Beckwith, Seth W.
Bodman, Lewis H.
Bowman, David E.
Brand, W. W.
Brewer, Lyman A.
Chapman, George L.
Chapman, Wm. C.
Cherry, Wm.
Coldham, Wm. W.
Collamore, Geo. A.
Curry, John H.
De Vilbiss, Allen.
Dice, Wm. G.
Dickey, Wm. A.
Doherty, E. W.
Donnelly, James.
Duncan, James A.
Ely, J. D.
Fisher, Albert W.
Fisher, Charles E.
Fisher, Wm. H.
Gardiner, Wm. G.
Gifford, W. R.
Gillette, W. J.
Girardot, A. J.
Grosh, L. C.
Gundrum, W. H.
Hasencamp, O.
Hathaway, Harrison.
Haynes, J. Purcell.
Heltman, E. W.
Heydrich, L. W.
Jacobi, Frank.
Jacobson, J. H.
Jerome, M. A.
Keller, John G.
Kitchen, Francis A.
Klauser, F. E.
Landman, Otto.
Lasalle, J. J.
Lawless, James T., Sr.
Lawless, James T., Jr.
Lukens, Charles.
Leslie, F. A.
Main, O. M.
McInnes, J. P.
McVety, Albert F.
Melchers, Edward.

Miller, Louis.
Newton, C. W.
North, John.
Prentiss, Pearce.
Reed, Calvin H.
Reinhart, James C.
Rieg, Philip S.
Root, Henry A.
Sabrail, J. D.
Schnetzler, A. C.
Sharpe, W. J.
Smead, H. E.
Smith, Anna Groff.
Smith, Chas. N.
Snyder, Walter H.
Stewart, W. D.
Storz, C.
Tait, P. G.
Thorn, Samuel S.
Tobey, Henry A.
Van Pelt, Charles L.
Wagar, Charles P.
Walker, Robert S.
Wickham, Wm.
Wilson, F. P.
Woods, Elizabeth.
Young, Nelson H.

TUSCARAWAS COUNTY MEDICAL SOCIETY.

T. H. Brannan.....President.
A. C. Dempster.....Vicepresident.
J. A. McCollam.....Treasurer.
Martha Shalter.....Secretary.

MEMBERS.

Anderson, B. G., Uhrichsville.
Barton, R. S., New Philadelphia.
Beers, A. M., Newcomerstown.
Blickensderfer, J., New Philadelphia.
Brannan, T. H., Canal Dover.
Dunn, E. S., Port Washington.
Dempster, A. C., Uhrichsville.
Finical, F. F., Dennison.
Gentsch, D. C., New Philadelphia.
Goudy, J. W. S., Newcomerstown.
Groves, J. E., Uhrichsville.
Gooding, J. J., Gilmore.
Gordon, Thomas, Uhrichsville.
Helms, F. G., Uhrichsville.
Hitchcock, J. L., Uhrichsville.
Hendershot, B. C., New Philadelphia.
Hughes, L. H., Dennison.
Kurtz, C. D., Tuscarawas.
Lower, G. F., Canal Dover.
Lower, J. D., Bakersville.
Mackaman, H. A., New Philadelphia.
McCollam, J. A., Uhrichsville.
Miller, A. T., Shanesville.
Patterson, C. N., Uhrichsville.
Quinn, D. E., Dennison.
Richards, Nancy D., New Philadelphia.
Richards, T. J. W., New Philadelphia.
Sawyer, C. H., Mineral City.
Schutzbach, J. C., Strasburg.
Shalter, Martha, Canal Dover.
Shanley, E. B., New Philadelphia.
Shauwecker, S., Canal Dover.
Smith, J. M., New Philadelphia.
Siffert, T. C., Newcomerstown.
Thompson, S. R., Uhrichsville.
Wagner, P. M., Canal Dover.
Willson, T. H., Dennison.
Weiss, Geo., Rogersville.
White, C. C., Mineral City.
Welty, O. S., Canal Dover.

UNION MEDICAL ASSOCIATION OF COLUMBIANA AND ADJOINING COUNTIES.

Auxiliary since 1879 Annual Meeting in May

F. T. Miles.....President.
S. R. McCready.....Vicepresident.
Della M. Walker.....Secretary.
Wm. Moore.....Treasurer.

MEMBERS

Albright, G. H., East Fairfield.
Anderson, James, Salem.
Bailey, W. N., East Liverpool.
Barckhoff, P. E., Salem.
Bates, James, Alliance.
Beach, A. M., Mineral Ridge.
Calhoun, John N., Lisbon.
Calhoun, W. M., East Liverpool.
Campbell, J. S., Wellsville.
Clark, W. R., East Liverpool.
Cope, A. L., Winona.
Dales, S. J., Alliance.
Farr, M. C., Wellsville.
Fawcett, R. C., North Jackson.
Gilmore, W. N., West Point.
Graham, Frank, Lisbon.
Griselle, E., Salem.
Hammond, J. R., Wellsville.
Hartford, P. C., East Palestine.
Heck, S., Salem.
Hill, A. J., Minerva.
Hobbs, W. A., East Liverpool.
Hoover, C. M., Alliance.
Hughes, W. K., Berlin Center.
Hulin, O. W., Greenford.
Johnson, L. L., Alliance.
Johnson, M., Alliance.
King, A. L., Youngstown.
King, F. M., Damascus.
Kurtz, H. B., Leetonia.
Marquis, T. B., Lisbon.
McConnell, S. M., Wellsville.
McCready, S. R., Leetonia.
McFarland, W. S., Wellsville.
McLaughlin, J. V., Lisbon.
Mealy, H. M., Palmyra.
Miles, F. T., Salem.
Miller, D. J., North Benton.
Moore, F. P., Lisbon.
Moore, Wm., Lisbon.
Nevin, J. E., Negley.
Nevin, W. C., Lisbon.
Ogden, C. B., East Liverpool.
Park, B. R., Wellsville.
Patterson, S. J., Elkton.
Pelley, H. J., Dungannon.
Ramsey, P. C., Alliance.
Roach, J. A., Alliance.
Santee, L. B., Marlborough.
Schaffer, H. H., Alliance.
Schiller, A. W., Salem.
Sturgeon, J., Leetonia.
Temple, J. C., Alliance.
Tressel, J. H., Alliance.
Walker, Della M., Salem.
Yengling, A. C., Salem.

UNION MEDICAL ASSOCIATION OF NORTHEASTERN OHIO.

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C. E. Norris.....First Vicepresident.
Edward Lauder.....Second Vicepresident.
J. H. Seiler.....Recording Secretary.
C. W. Milliken.....Corresponding Secretary.
H. H. Jacobs.....Treasurer

MEMBERS

Aldrich, C. J., Cleveland.
Allen, Dudley P., Cleveland.
Baker, A. R., Cleveland.
Baker, W. O., Louisville.
Banker, D. F., Canton.
Bauer, F. J., Mogadore.
Bauer, M. M., Lake P. O.
Biechele, Robert, Canton.
Blankenhorn, H., Orrville.
Bolick, C. A., Wadsworth.
Bowman, D. S., Akron.
Boyd, James P., Akron.
Brannan, T. H., Canal Dover.
Brown, E. E., Cleveland.
Bruner, W. E., Cleveland.
Burns, Katherine, Canton.
Bye, J. M., Canton.
Calhoun, F. P., Canton.
Campbell, A. B., Canal Fulton.
Campbell, J. F., Greenville.
Chase, W. S., Akron.
Conn, Eli, Akron.
Corl, H. E., Middle Branch.
Corlett, Wm. T., Cleveland.
Crile, G. W., Cleveland.
Culbertson, N. W., Massillon.
Dawson, N. B., Sterling.
DeWitt, John P., Pierce.
Drysdale, H. H., Lodi.
Ebright, L. S., Akron.
Everhard, N. S., Wadsworth.
Exline, C. E., Canton.
Fehr, Peter, Akron.
Foltz, A. E., Akron.
Fraunfelter, Jas., Canton.
Gardner, G. A., Doylestown.
Gardner, D. W., Brookfield.
Gardner, O. S., Massillon.
Gans, D. W., Massillon.
Goodrich, C. H., Sandyville.
Grant, J. G., Akron.
Greenamyer, P. S., Orrville.
Haefele, Geo. H., Cleveland.
Haney, J. C., Dalton.
Harmon, J., Warren.
Held, Chas. E., Akron.
Hill, C. T., Akron.
Hobson, J. F., Cleveland.
Hoover, C. F., Cleveland.
Hoover, C. M., Alliance.
House, A. F., Cleveland.
Hudson, J. F., Canton.
Humiston, Wm. H., Cleveland.
Ingersoll, John M., Cleveland.
Jacobs, H. H., Akron.
Jacobs, W. C., Akron.
Kahler, J. Frank, Canton.
Lauder, Edward, Cleveland.
Lee, J. L., Akron.
Leonard, W. W., Akron.
Lichty, M. J., Cleveland.
Lincoln, Walter R., Cleveland.
Lower, W. E., Cleveland.
Lyman, C. M., Wadsworth.
Mantey, Chas., Minerva.
March, E. J., Canton.
March, Harry A., Canton.
March, Julia E., Youngstown.
Marchand, J. F., Canton.
Martin, T. C., Cleveland.
McKeen, Wm., Canal Dover.
Miller, M. F., Wadsworth.
Miller, T. Clark, Massillon.
Millikin, B. L., Cleveland.
Moody, M. M., Chatham.
Morgan, D. H., Akron.
Morrow, E. O., Canton.
Morrow, E. P., Canton.
Myers, E. P., Canton.
Norris, C. E., Akron.
Peck, George S., Youngstown.
Pomerine, H. P., Canton.
Pumphrey, R. J., Massillon.
Pilkey, B. C. N., Lawrence.
Pixley, S., Akron.
Pope, F. F. H., Dalton.
Portman, E. O., Canton.
Rankin, I. C., Akron.
Reed, F. C., Akron.
Robb, Hunter, Cleveland.
Rosenwasser, M., Cleveland.
Russel, F. P., Suffield.
Sacket, W. A., Akron.
Sawyer, J. P., Cleveland.
Sawyer, Chas. H., Massillon.
Schuffle, H. M., Canton.
Schilling, C. E., Canton.
Scott, N. Stone, Cleveland.
Scott, X. C., Cleveland.
Seiler, J. H., Akron.
Shackleton, W. D., Cleveland.
Sherman, A. M., Kent.
Sherman, H. G., Cleveland.
Shirey, J. L., Akron.
Simpson, F. H., Akron.
Sippy, A. F., Akron.

Sisler, Adam, Mimisila.
Skeel, R. E., Cleveland.
Smith, D. B., Cleveland.
Smith, Robert A., Ghent.
Spencer, E. R., Doylestown.
Starr, G. L., Hudson.
Steel, Wm. C., New Berlin.
Stern, Walter G., Cleveland.
Straight, H. S., Cleveland.
Taggart, W. W., Wooster.
Theiss, H. C., Akron.
Theiss, G. A., Akron.
Tobias, E. H., Inland.
Todd, George M., Akron.
Tressel, J. H., Alliance.
Tressel, J. K., Alliance.
Tyrrell, Esther M., Canton.
Underwood, E. S., Akron.
Upson, H. S., Cleveland.
Waldron, S. P., Akron.
Walker, A. B., Canton.
Walker, C. A., Louisville.
Welty, Cullen F., Cleveland.
Wirt, W. E., Cleveland.
Wise, S. P., Millersburg.
Woods, A. T., Loyal Oak.
Workman, T. W., Akron.
Wright, S. J., Akron.
Zinninger, George F., Canton.

WARREN COUNTY MEDICAL SOCIETY.

Herschel Fisher.....President.
Maria M. Romine.....Vicepresident.
T. E. Keelor.....Secretary.
H. J. Death.....Treasurer.

MEMBERS

Blair, B. H., Lebanon.
Clagett, P. D., Ridgeville.
Clayton, B. F., Franklin.
Collins, J. B., Butlerville.
Death, H. J., Franklin.
Evans, Otho, Franklin.
Evans, Rice K., Franklin.
Fisher, Herschel, Lebanon.
Henderson, Carl, Waynesburg.
Hough, C. A., Lebanon.
Keelor, T. E., Lebanon.
McCready, James, Monroe.
Moore, W. J., Carlisle.
Mounts, J. L., Morrow.
Mounts, Leonard, Morrow.
Mulford, J. V., Lebanon.
Phillips, John T., Oregonia.
Randall, C. G., Harveysburg.
Roberts, A. C., Morrow.
Romine, M. M., Harveysburg.
Scott, John, Cincinnati.
Scott, William, Loveland.
Sherwood, Thomas, Waynesville.
Stevens, E. S., Lebanon.
Vandervoort, J. W., Harveysburg.
Spence, A. B., S. Lebanon.
Ward, J. W., Lytle.
Williams, D. A., Franklin.
Witham, J. E., Harveysburg.
Wright, A. T., Blueball.
Wright, J. M., Red Lion.

WASHINGTON COUNTY MEDICAL SOCIETY.

J. D. Cotton.....President.
I. P. Eddy.....Vicepresident.
John B. McClure.....Secretary and Treasurer.

MEMBERS

Adair, S. G., Beverly.
Athey, R. W., Marietta.
Ballard, Chas., Marietta.
Bohl, Jacob, Marietta.
Bohl, Jno., Sr., Watertown.
Cooke, E. P., Barlow.
Cotton, J. D., Marietta.
Cunningham, S. A., Marietta.
Dabney, Wm. R., Marietta.
Dorr, A. I., Marietta.

Eddy, C. W., Marietta.
Fleming, A. C., Marietta.
Funk, H. H., Beverly.
Gale, Geo. T., Newport.
Gallagher, C. A., Marietta.
Hadley, Jas., Masterton.
Hardy, Jas., Whipple.
Hart, R. B., Jr., Marietta.
Hart, Sam'l, Marietta.
Hayward, E. T., Waterford.
Hill, E. T., Sitka.
Hill, H. W., Marietta.
Kelley, P. H., Waterford.
Lambert, O. A., Marietta.
Martin, John H., New Matamoras.
Mason, J. L., Marietta.
McClure, James, Marietta.
McClure, John B., Marietta.
McGee, F. S., Belpre.
McKim, F. E., Marietta.
Metcalf, Wm. H., Reno.
Park, J. A., Brown's Mills.
Skwington, Jno., Marietta.
Sparling, F. R., Gasville.
Taylor, J. R., Archer's Fork.
Trichle, E. H., Cutler.
Ward, J. W., Archer's Fork.
Warren, L. E., Marietta.
Warren, W. W., Newport.
West, W. L., New Matamoras.
Willis, O. M., Marietta.

WAYNE COUNTY MEDICAL SOCIETY.

L. A. Yocum.....President.
P. S. Greenamyer.....Vicepresident.
H. Blankenhorn.....Secretary.
D. H. Morgan.....Treasurer.

MEMBERS

Baird, R. J., Creston.
Bashford, A. T., Wooster.
Beer, J. D., Wooster.
Beidler, Wm., Marshallville.
Bertolette, H. B., Shreve.
Blankenhorn, H., Orrville.
Carlin, G. A., West Salem.
Clevison, N. S., West Lebanon.
Dawson, D. W., Sterling.
Essick, Geo. C., Congress.
Faber, Wm., Orrville.
Firestone, W. W., Wooster.
Gardner, G. E., Doylestown.
Greenamyer, P. S., Orrville.
Hague, I. H., Shreve.
Haney, J. C., Dayton.
Hart, A. H., Wooster.
Hunt, A. H., Wooster.
Jamison, J. R., Applecreek.
Kinney, J. J., Wooster.
King, J. H., Applecreek.
Knestrick, A. C., Creston.
Lehr, J. W., Wooster.
Lerch, C. A., Wooster.
Little, G. W., Creston.
Matteer, H. N., Wooster.
McKinney, Fred, Fredericksburg.
McMillen, W. H., Orrville.
Morgan, D. H., Smithville.
Palmer, J. M., Dalton.
Paul, R. C., Shreve.
Pemberthy, J. H., Mt. Eaton.
Pilkey, B. C., Doylestown.
Pope, F. F. H., Dalton.
Ritman, O., West Lebanon.
Roudebaugh, E. C., Lattisburg.
Ryall, George, Wooster.
Stoll, Harry J., Wooster.
Stoll, J. H., Wooster.
Shie, D. F., Fredericksburg.
Spencer, E. R., Doylestown.
Sullivan, H. J., Congress.
Todd, J. H., Wooster.
Willford, H. B., Marshallville.
Winller, J. H., Applecreek.
Wise, D. B., Mt. Eaton.
Winslow, Lattasburg.
Yocum, L. A., Wooster.

Constitution

ARTICLE I.—NAME OF THE ASSOCIATION.

Name.

The name and title of this organization shall be the OHIO STATE MEDICAL ASSOCIATION.

ARTICLE II.—PURPOSES OF THE ASSOCIATION.

Purposes.

The purpose of this ASSOCIATION shall be to federate and bring into one compact organization the entire medical profession of the State of Ohio, and to unite with similar Associations in other States to form the American Medical Association; with a view to the extension of medical knowledge, and to the advancement of medical science; to the elevation of the standard of medical education, and to the enactment and enforcement of just medical laws; to the promotion of friendly intercourse among physicians, and to the guarding and fostering of their material interests; and to the enlightenment and direction of public opinion in regard to the great problems of state medicine; so that the profession shall become more capable and honorable within itself, and more useful to the public in the prevention and cure of disease, and in prolonging and adding comfort to life.

ARTICLE III.—COMPONENT SOCIETIES.

Component Societies.

Component Societies shall consist of those County Medical Societies which hold charters from this ASSOCIATION.

ARTICE IV.—COMPOSITION OF THE ASSOCIATION.

Composition.

SECTION 1. This ASSOCIATION shall consist of Members, Delegates and Guests.

Members.

SEC. 2. MEMBERS. The members of this ASSOCIATION shall be the members of the Component County Medical Societies.

Delegates.

SEC. 3. DELEGATES. Delegates shall be those members who are elected in accordance with this Constitution and By-Laws to represent their respective Component County Societies in the House of Delegates of this ASSOCIATION.

Guests.

SEC. 4. GUESTS. Any distinguished physician not a resident of this State may become a Guest during any Annual

Session upon invitation of the ASSOCIATION or its Council, and shall be accorded the privilege of participating in all the scientific work for that Session.

ARTICLE V.—HOUSE OF DELEGATES.

House of Delegates.

The House of Delegates shall be the legislative and business body of the ASSOCIATION, and shall consist of (1) Delegates elected by the Component County Societies, and (2), *ex-officio*, the officers of the ASSOCIATION as defined in this Constitution.

ARTICLE VI.—SECTIONS AND DISTRICT SOCIETIES.

Sections.

The House of Delegates may provide for a division of the scientific work of the ASSOCIATION into appropriate Sections, and for the organization of such Councilor-District Societies as will promote the best interests of the profession, such societies to be composed exclusively of members of Component County Societies.

District Societies.

ARTICLE VII.—SESSIONS AND MEETINGS.

Sessions. Meetings.

SECTION 1. The ASSOCIATION shall hold an Annual Session, during which there shall be held daily not less than two General Meetings, which shall be open to all registered members, delegates and guests.

SEC. 2. The time and place for holding each Annual Session shall be fixed by the House of Delegates.

ARTICLE VIII.—OFFICERS.

Officers.

SECTION 1. The officers of this ASSOCIATION shall be a President, four Vice-Presidents, a Secretary, a Treasurer, and ten Councilors.

Term of Office.

SEC. 2. The President and Vice-Presidents shall be elected for a term of one year. The Secretary, Treasurer and Councilors shall be elected for terms of five years each, the Councilors being divided into classes so that two shall be elected each year. All of these officers shall serve until their successors are elected and installed.

Election.

SEC. 3. The officers of this ASSOCIATION shall be elected by the House of Delegates on the morning of the last day of the Annual Session, but no Delegate shall be eligible to any office named in the preceding section, except that of Councilor, and no person shall be elected to any such office who is

Eligibility.

not in attendance upon that Annual Session and who has not been a member of this ASSOCIATION for the previous two years.

ARTICLE IX.—FUNDS AND EXPENSES.

Assessments.

Expenses.

Funds for meeting the expenses of the ASSOCIATION shall be arranged for by the House of Delegates by an equal per capita assessment upon each County Society to be fixed by the House of Delegates, by voluntary contribution, and from the profits of its publications. Funds may be appropriated by the House of Delegates to defray the expenses of the Annual Sessions, for publication, and for such other purposes as will promote the welfare of the ASSOCIATION and the profession.

ARTICLE X.—REFERENDUM.

Referendum.

The General Meeting of the ASSOCIATION may, by a two-thirds vote, order a general referendum upon any question pending before the House of Delegates, and the House of Delegates may, by a similar vote of its own members, or after a like vote of the General Meeting, submit any such question to the membership of the ASSOCIATION for a final vote; and if the persons voting shall comprise a majority of all the members, a majority of such vote shall determine the question, and be binding upon the House of Delegates.

ARTICLE XI.—THE SEAL.

Seal.

The ASSOCIATION shall have a common Seal, with power to break, change or renew the same at pleasure.

ARTICLE XII—AMENDMENTS.

Amendments.

The House of Delegates may amend any article of this Constitution by a two-thirds vote of the delegates registered at that Annual Session, provided that such amendment shall have been presented in open meeting at the previous Annual Session, and that it shall have been sent officially to each Component County Society at least two months before the session at which final action is to be taken.

By-Laws

CHAPTER I.—MEMBERSHIP.

SECTION 1. All members of the Component County Societies shall be privileged to attend all meetings and take part in all of the proceedings of the Annual Sessions, and shall be eligible to any office within the gift of the ASSOCIATION. **Membership.**

SEC. 2. The name of a physician upon the properly certified roster of members, or list of delegates, of a chartered County Society which has paid its annual assesment, shall be *prima facie* evidence of his right to register at the annual session in the respective bodies of this ASSOCIATION. **Qualification.**

SEC. 3. No person who is under sentence of suspension or expulsion from any Component Society of this ASSOCIATION, or whose name has been dropped from its roll of members, shall be entitled to any of the rights or benefits of this ASSOCIATION, nor shall he be permitted to take any part in any of its proceedings until such time as he has been relieved of his disability. **Disability.**

SEC. 4. Each member in attendance at the Annual Session shall enter his name on the registration book, indicating the Component Society of which he is a member. When his right to membership has been verified by reference to the roster of his society, he shall receive a badge which shall be evidence of his right to all the privileges of membership at that session. No member or delegate shall take part in any of the proceedings of an Annual Session until he has complied with the provisions of this section. **Registration.**

CHAPTER II.—ANNUAL AND SPECIAL SESSIONS OF THE ASSOCIATION.

SECTION 1. The ASSOCIATION shall hold an Annual Session at such time and place as has been fixed by the House of Delegates at the preceding Annual Session. **Annual Session.**

SEC. 2. Special sessions of either the ASSOCIATION or House of Delegates shall be called by the President at his discretion or upon petition of twenty delegates. **Special Session.**

CHAPTER III.—GENERAL MEETINGS.

General Meetings.

SECTION 1. The General Meetings shall include all registered Members, Delegates, and Guests, who shall have equal rights to participate in the proceedings and discussions; and, except guests, to vote on pending questions. Each General Meeting shall be presided over by the President, or in his absence or disability, or at his request, by one of the Vice-Presidents. Before it, at such time and place as may have been arranged, shall be delivered the annual address of the President and the annual orations, and the entire time of the Session, so far as may be, shall be devoted to papers and discussions relating to scientific medicine.

Functions.

SEC. 2. The General Meeting shall have authority to create committees or commissions for scientific investigations of special interest and importance to the profession and public, and to receive and dispose of reports of the same; but any expense in connection therewith must first be approved by the House of Delegates.

Program.

SEC. 3. Except by special vote, the order of exercises, papers and discussions as set forth in the official program shall be followed from day to day until it has been completed.

Time limit.

SEC. 4. No address or paper before the ASSOCIATION, except those of the President and Orators, shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes, nor except by unanimous consent more than once on any subject.

Papers.

SEC. 5. All papers read before the ASSOCIATION shall be its property. Each paper shall be deposited with the Secretary when read, and if this is not done it shall not be published.

CHAPTER IV.—HOUSE OF DELEGATES.

House of Delegates.

SECTION 1. The House of Delegates shall meet annually at the time and place of the Annual Session of the ASSOCIATION, and shall so fix its hours of meeting as not to conflict with the first General Meeting of the ASSOCIATION, or with the meeting held for the address of the President and the annual orations, and so as to give delegates an opportunity to attend the other scientific proceedings and discussions so far as is consistent with their duties. If the business interests of the ASSOCIATION and profession require, it may meet in advance, or remain in session after the final adjournment of the General Meeting.

Early Meetings.

SEC. 2. Each Component County Society shall be entitled to send to the House of Delegates each year one delegate for every 100 members, and one for each fraction thereof, but each County Society holding a charter from this ASSOCIATION, which has made its annual report and paid its assessment as provided in this Constitution and By-Laws, shall be entitled to one delegate. **Ratio of Representation**

SEC. 3. A majority of the registered delegates shall constitute a quorum, and all of the meetings of the House of Delegates shall be open to members of the ASSOCIATION. **Quorum.**

SEC. 4. It shall, through its officers, through the Council, and otherwise, give diligent attention to and foster the scientific work and spirit of the ASSOCIATION, and shall constantly study and strive to make each Annual Session a stepping-stone to future ones of higher interest. **Duties—Scientific.**

SEC. 5. It shall consider and advise as to the material interests of the profession, and of the public in those important matters wherein it is dependent upon the profession, and shall use its influence to secure and enforce all proper medical and public-health legislation, and to diffuse popular information in relation thereto. **Material.**

SEC. 6. It shall make careful inquiry into the condition of the profession of each county in the State, and shall have authority to adopt such methods as may be deemed most efficient for building up and increasing interest in such County Societies as already exist, and for organizing the profession in counties where societies do not exist. It shall especially and systematically endeavor to promote friendly intercourse between physicians of the same locality, and shall continue these efforts in every county of the State, until every physician who can be made reputable has been brought under medical society influence. **Organizing.** **Fraternal.**

SEC. 7. It shall encourage postgraduate work in medical centers, as well as home-study and research, and shall endeavor to have the results of the same utilized and intelligently discussed in the County Societies. With these ends in view, five years after the adoption of these By-Laws no voluntary paper shall be placed upon the annual program or be heard in the ASSOCIATION, which has not first been read in the County Society of which the author is a member. **Educational.**

SEC. 8. It shall elect representatives to the House of Delegates of the American Medical Association in accordance **Representative.**

with the Constitution and By-Laws of that body in such manner that not more than one-half of the Delegates shall be elected in any one year.

Charters. SEC. 9. It shall, upon application, provide and issue charters to County Societies organized to conform to the spirit of this Constitution and By-Laws.

Multiple County Societies. SEC. 10. In sparsely settled sections it shall have authority to organize the physicians of two or more counties into societies to be designated by hyphenating the names of two or more counties so as to distinguish them from district and other classes of societies, and these societies, when organized and chartered, shall be entitled to all the privileges and representation provided herein for County Societies, until such counties may be organized separately.

Councilor Districts. SEC. 11. It shall divide the counties of the State into ten Councilor Districts, and, when the best interests of the ASSOCIATION and profession will be promoted thereby, organize in each a district medical society, to meet midway between the Annual Sessions of this ASSOCIATION. Members of the chartered county societies, and none others, shall be members of such district societies. When so organized, from the Presidents of such district societies shall be chosen the Vice-Presidents of the ASSOCIATION, and the Presidents of the county societies of the district shall be the Vice-Presidents of such district societies.

Committees. SEC. 12. It shall have authority to appoint committees for special purposes from among members of the ASSOCIATION who are not members of the House of Delegates. Such committees may report to the House of Delegates in person, and may participate in the debate on their reports.

Revision. SEC. 13. It shall approve all memorials and resolutions issued in the name of the ASSOCIATION before the same shall become effective, providing it shall not make void the verdict of a referendum.

Report. SEC. 14. It shall present a summary of its proceedings to the last general meeting of each annual session, and shall publish the same in the Transactions.

CHAPTER V.—ELECTION OF OFFICERS.

Elections. SECTION 1. All elections shall be by secret ballot, and a majority of the votes cast shall be necessary to elect.

Nominations. SEC. 2. The House of Delegates on the first day of the Annual Session shall select a Committee on Nominations

consisting of ten delegates, no two of whom shall be from the same Councilor District. It shall be the duty of this committee to consult with the members of the ASSOCIATION and to hold one or more meetings at which the best interests of the ASSOCIATION and of the profession of the State for the ensuing year shall be carefully considered. The committee shall report the result of its deliberations to the House of Delegates in the form of a ticket containing the names of three members for the office of President and of one member for each of the other offices to be filled at that annual session. No two candidates for President shall be named from the same county.

Time.

SEC. 3. The report of the Nominating Committee and the election of officers shall be the first order of business of the House of Delegates after the reading of the minutes on the morning of the last day of the Annual Session.

Reservation.

SEC. 4. Nothing in this article shall be construed to prevent additional nominations being made by members of the House of Delegates.

CHAPTER VI.—DUTIES OF OFFICERS.

President.

SECTION 1. The President shall preside at all meetings of the ASSOCIATION and of the House of Delegates; shall appoint all committees not otherwise provided for; shall deliver an annual address at such time as may be arranged; shall give a deciding vote in case of a tie; and shall perform such other duties as custom and parliamentary usage may require. He shall be the real head of the profession of the State during his term of office, and, as far as practicable, shall visit by appointment the various sections of the State and assist the Councilors in building up the County Societies, and in making their work more practical and useful.

Vice-Presidents.

SEC. 2. The Vice-Presidents shall assist the President in the discharge of his duties. In the event of the death, resignation or removal of the President, the Vice-Presidents shall succeed to the presidency in the order of their election.

Treasurer.

SEC. 3. The Treasurer shall give bond for the trust reposed in him, whenever the House of Delegates shall deem it requisite. He shall demand and receive all funds due the ASSOCIATION, together with bequests and donations. He shall, under the direction of the House of Delegates, sell or lease any estate belonging to the ASSOCIATION, and execute the necessary papers; and shall, in general, subject to such

direction, have the care and management of the fiscal affairs of the ASSOCIATION. He shall pay money out of the Treasury only upon a written order of the President, countersigned by the Secretary; he shall subject his accounts to such examination as the House of Delegates may order, and he shall annually render an account of his doings and of the state of the funds in his hands. He shall charge upon his books the assessments against each Component County Society at the end of the fiscal year; he shall collect and make proper credits for the same, and perform such other duties as may be assigned to him.

Secretary.

SEC. 4. The Secretary, acting with the Committee on Scientific Work, shall prepare and issue the programs for and attend all meetings of the ASSOCIATION and of the House of Delegates, and he shall keep minutes of their respective proceedings in separate record books. He shall be custodian of all record books and papers belonging to the ASSOCIATION, except such as properly belong to the Treasurer, and shall keep account of and promptly turn over to the Treasurer all funds of the ASSOCIATION which come into his hands. He shall provide for the registration of the members and delegates at the Annual Sessions. He shall keep a card-index register of all the legal practicians of the State by counties, noting on each his status in relation to his County Society, and upon request shall transmit a copy of this list to the American Medical Association for publication. In so far as it is in his power he shall use the printed matter, correspondence and influence of his office to aid the Councilors in the organization and improvement of the County Societies, and in the extension of the power and usefulness of this ASSOCIATION. He shall conduct the official correspondence, notifying members of meetings, officers of their election, and committees of their appointment and duties. He shall act as Chairman of the Committeee on Scientific Work and on Publication. He shall employ such assistants as may be ordered by the Council or the House of Delegates. He shall annually make a report of his doings to the House of Delegates.

In order that the Secretary may be enabled to give that amount of time to his duties which will permit of his becoming proficient, it is desirable that he should receive some compensation. The amount of his salary shall be fixed by the House of Delegates.

CHAPTER VII.—COUNCIL.

SECTION 1. The Council shall hold daily meetings during the Annual Session of the ASSOCIATION and at such other times as necessity may require, subject to the call of the Chairman or on petition of three Councilors. It shall meet on the last day of the Annual Session of the ASSOCIATION for reorganization and for the outlining of work for the ensuing year. At this meeting it shall elect a Chairman and Secretary, and it shall keep a permanent record of its proceedings. It shall, through its Chairman, make an annual report to the House of Delegates at such time as may be provided. **Council.**

SEC. 2. Each Councilor shall be organizer, peacemaker and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, for inquiring into the condition of the profession, and for improving and increasing the zeal of the County Societies and their members. He shall make an annual report of his doings, and of the condition of the profession of each county in his district, to each annual session of the House of Delegates. The necessary traveling expenses incurred by such Councilor in the line of the duties herein imposed may be allowed by the House of Delegates upon a proper itemized statement, but this shall not be construed to include his expense in attending the Annual Session of the ASSOCIATION. **Duties—Individual.**

SEC. 3. Collectively the Council shall be the Board of Censors of the ASSOCIATION. It shall consider all questions involving the rights and standing of members, whether in relation to other members, to the Component Societies, or to this ASSOCIATION. All questions of an ethical nature brought before the House of Delegates or the General Meeting shall be referred to the Council without discussion. It shall hear and decide all questions of discipline affecting the conduct of members or of a County Society, upon which an appeal is taken from the decision of an individual Councilor. Its decision in all such cases shall be final. **Collective.**

SEC. 4. The Council shall have the right to communicate the views of the profession and of the ASSOCIATION in regard to health, sanitation and other important matters to the public and to the lay press. Such communications shall be officially signed by the Chairman and Secretary of the Council, as such. **Powers.**

CHAPTER VIII.—COMMITTEES.

Standing Committees.

SECTION 1. The Standing Committees shall be as follows:

A Committee on Scientific Work.

A Committee on Public Policy and Legislation.

A Committee on Publication.

A Committee on Nominations.

A Committee on Arrangement, and such other committees as may be necessary. Such committees shall be elected by the House of Delegates, unless otherwise provided.

Scientific Work.

SEC. 2. The Committee on Scientific Work shall consist of three members, of which the Secretary shall be a member and Chairman, and shall determine the character and scope of the scientific proceedings of the ASSOCIATION for each session, subject to the instructions of the House of Delegates or of the ASSOCIATION, or to the provisions of the Constitution and By-Laws. Thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers, discussions and other business shall be presented, which shall be adhered to by the ASSOCIATION as nearly as practicable.

Public Policy and Legislation.

SEC. 3. The Committee on Public Policy and Legislation shall consist of three members and the President and Secretary. Under the direction of the House of Delegates it shall represent the Association in securing and enforcing legislation in the interest of the public health and of scientific medicine. It shall keep in touch with professional and public opinion, shall endeavor to shape legislation so as to secure the best results for the whole people, and in local, State and national affairs and elections, it shall utilize every organized influence of the profession to promote the general welfare. Its work shall be done with the dignity becoming a great profession and with that wisdom which will make effective its power and influence. It shall have authority to be heard before the entire ASSOCIATION upon questions of great concern at such time as may be arranged during the Annual Session.

Publication.

SEC. 4. The Committee on Publication shall consist of three members, of which the Secretary shall be Chairman, and shall have referred to it all reports on scientific subjects, and all scientific papers and discussions heard before the ASSOCIATION. It shall be empowered to curtail or abstract

papers and discussions, and any paper referred to it which may not be suitable for publication in the Transactions may be returned to the author. The committee shall have authority to arrange for the publication and distribution of the Transactions after receiving competitive bids, and shall use diligence in getting them into the hands of members. All papers read before the ASSOCIATION shall be the property of the ASSOCIATION.

Nomination.

SEC. 6. The Committee on Nominations shall be appointed and perform its duties in accordance with the provisions of Chapter V, Section 2, of these By-Laws.

Arrangements.

SEC. 7. The Committee of Arrangements shall consist of the Component Society in the territory in which the Annual Session is to be held. It shall, by committees of its own selection, provide suitable accommodations for the meeting places of the ASSOCIATION and of the House of Delegates, and of their respective committees, and shall have general charge of all the arrangements. Its Chairman shall report an outline of the arrangements to the Secretary for publication in the program, and shall make additional announcements during the session as occasion may require.

CHAPTER IX.—ASSESSMENTS AND EXPENDITURES.

Annual Dues.

SECTION 1. An assessment of one dollar per capita on the membership of the Component Societies is hereby made the annual dues of this ASSOCIATION. The Secretary of each County Society shall forward its assessment together with its roster of all officers and members, list of delegates, and list of non-affiliated physicians of the county to the Secretary of this ASSOCIATION thirty days in advance of each Annual Session.

Penalty for Failure to Remit.

SEC. 2. Any County Society which fails to pay its assessment, or make the reports required, on or before the date above stated, shall be held as suspended, and none of its members or delegates shall be permitted to participate in any of the business or proceedings of the ASSOCIATION or of the House of Delegates until such requirements have been met.

Appropriations.

SEC. 3. All motions or resolutions appropriating money shall specify a definite amount, or so much thereof as may be necessary for the purpose indicated, and must be approved by the Council and House of Delegates on a call of the ayes and noes.

CHAPTER X.—ETHICAL PRINCIPLES.

Ethics.

The ethical principles governing the members of the American Medical Association shall govern the conduct of members of this ASSOCIATION in their relations to each other and to the public.

CHAPTER XI.—RULES OF ORDER.

Rules of Order.

The deliberations of this ASSOCIATION shall be governed by parliamentary usage as contained in Robert's Rules of Order, unless otherwise determined by a vote of its respective bodies.

CHAPTER XII.—COUNTY SOCIETIES.

County Societies—Affiliation.

SECTION 1. All County Societies now in affiliation with the State Association or those that may hereafter be organized in this State, which have adopted principles of organization not in conflict with this Constitution and By-Laws, shall, upon application to the House of Delegates, receive a charter from and become a component part of this ASSOCIATION.

Organization

SEC. 2. As rapidly as can be done after the adoption of this Constitution and By-Laws, a medical society shall be organized in every county in the State in which no Component Society exists, and charters shall be issued thereto.

Charters.

SEC. 3. Charters shall be issued only upon approval of the House of Delegates and shall be signed by the President and Secretary of this ASSOCIATION. The House of Delegates shall have authority to revoke the charter of any Component County Society whose actions are in conflict with the letter or spirit of this Constitution and By-Laws.

One Society in one County.

SEC. 4. Only one component medical society shall be chartered in any county. Where more than one county society exists, friendly overtures and concessions shall be made, with the aid of the Councilor for the district if necessary, and all of the members brought into one organization. In case of failure to unite, an appeal may be made to the Council, which shall decide what action shall be taken.

Qualification for Membership.

SEC. 5. Each County Society shall judge of the qualification of its own members, but as such societies are the only portals to this ASSOCIATION and to the American Medical Association, every reputable and legally registered physician who is practicing, or who will agree to practice, nonsectarian

medicine shall be entitled to membership. Before a charter is issued to any County Society, full and ample notice and opportunity shall be given to every such physician in the county to become a member.

SEC. 6 Any physician who may feel aggrieved by the action of the society of his county in refusing him membership, or in suspending or expelling him, shall have the right of appeal to the Council and the House of Delegates. **Appeal.**

SEC. 7. In hearing appeals the Council may admit oral or written evidence as in its judgment will best and most fairly present the facts, but in case of every appeal, both as a Board and as individual Councilors in district and county work, efforts at conciliation and compromise shall precede all such hearings. **Hearings.**

SEC. 8. When a member in good standing in a Component Society moves to another county in this State, his name, upon request, shall be transferred without cost to the roster of the County Society into whose jurisdiction he moves. **Removals.**

SEC. 9. A physician living on or near a county line may hold his membership in that county most convenient for him to attend, on permission of the society in whose jurisdiction he resides.

SEC. 10. Each County Society shall have general direction of the affairs of the profession in the county, and its influence shall be constantly exerted for bettering the scientific, moral and material condition of every physician in the county. Systematic efforts shall be made by each member, and by the society as a whole, to increase the membership until it embraces every qualified physician in the county. **Functions and Duties.**

SEC. 11. Frequent meetings shall be encouraged, and the most attractive programs arranged that are possible. The younger members shall be especially encouraged to do post-graduate and original-research work, and to give the Society the first benefit of such labors. Official position and other preferments shall be unstintingly given to such members. **Work.**

SEC. 12. At some meeting in advance of the annual session of this ASSOCIATION each County Society shall elect a delegate or delegates to represent it in the House of Delegates of this ASSOCIATION in the proportion of one delegate to each one hundred members, or fraction thereof, and the Secretary of the Society shall send a list of such delegates to the Secretary of this ASSOCIATION, at least ten days before the Annual Session. **Delegates.**

List of Physicians in County.

SEC. 13. The Secretary of each County Society shall keep a roster of its members, and a list of the nonaffiliated registered physicians of the county, in which shall be shown the full name, address, college and date of graduation, date of license to practice in this State, and such other information as may be deemed necessary. He shall furnish an official report containing such information, upon blanks supplied him for the purpose, to the Secretary of this ASSOCIATION, thirty days in advance of each Annual Session, and at the same time that the dues accruing from the annual assessment are sent in. In keeping such roster the Secretary shall note any changes in the personnel of the profession by death, or by removal to or from the county, and in making his annual report he shall be certain to account for every physician who has lived in the county during the year.

CHAPTER XIII.—AMENDMENTS.

Amendments.

These By-Laws may be amended at any Annual Session by a majority vote of all the delegates present at that session, after the amendment has been laid upon the table for one day.

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